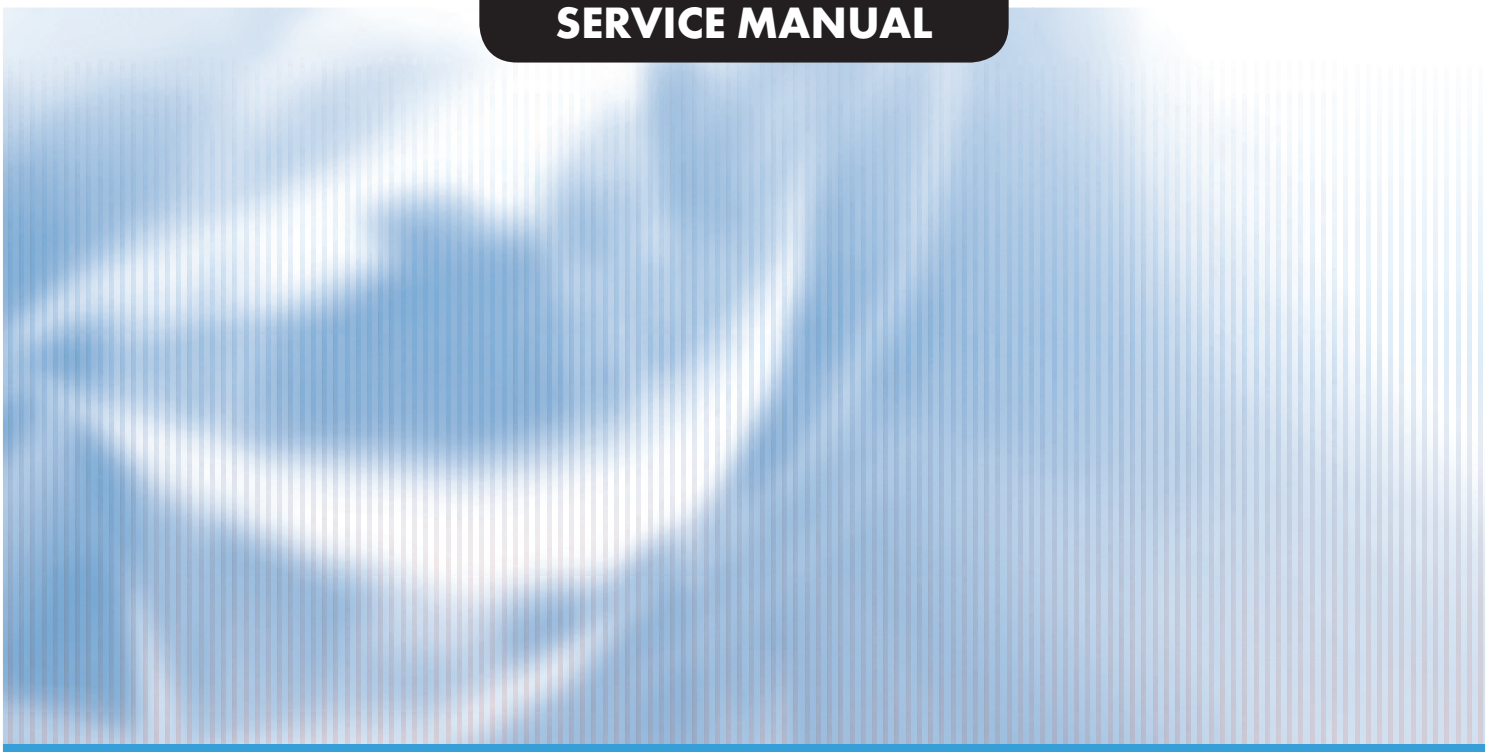
SERVICE MANUAL



DC INVERTER SERIES

OUTDOOR AND INDOOR UNITS

CASSETTE, FLOOR&CEILING, DUCT UNITS OUTDOOR UNITS

sinclair

AIR CONDITIONING

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Chapter Ⅰ Introduction to Products

1. Kinds of Products

	Universal outdoor unit		Duct type	Floor ceiling type	Cassette type	Remark
			ASD-*AI(-3)	ASF-*AI(-3)	ASC-*AI(-3)	
	ASGE-18AI	Single phase	18	18	18	
	ASGE-24AI		24	24	24	
	ASGE-36AI		36	36	36	
	ASGE-36AI-3	Three phase	36	36	36	
	ASGE-42AI-3		42	42	42	

Power supply mode：Single phase 1PH 220－240V ～ 50Hz
Three phase 3PH 380－415V ～ 50Hz

Outline of Products (Outdoor Unit)

ASGE-18AI

ASGE-24AI

ASGE-36AI

ASGE-36AI-3
ASGE-42AI-3

Outline of Products (Indoor Units)

Duct type indoor **unit**

ASD-18AI
ASD-24AI
ASD-36AI
ASD-42AI

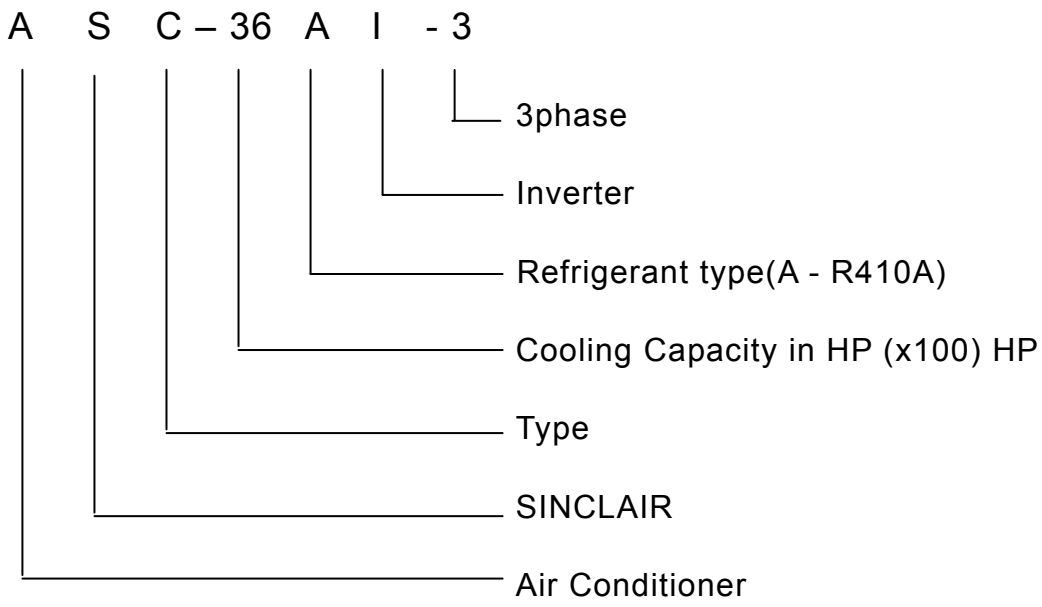
Floor ceiling type indoor **unit**

ASF-18AI
ASF-24AI
ASF-36AI
ASF-42AI

Cassette type indoor **unit**

ASC-18AI
ASC-24AI
ASC-36AI
ASC-42AI

2. Model Designation



2.1 Regulation of Units Classification

Units classification	Code
Outdoor unit	GE
Cassette type	C
Floor/Ceiling type	F
Duct type	D

Model Designation

（1）ASGE-18AI means universal outdoor unit with nominal cooling capacity of 18000Btu, signle phase power supply of 220~240V，50Hz, heat pump, DC inverter,T1 condition and refrigerant of R410a .

（2）ASGE-42AI-3 means universal outdoor unit with nominal cooling capacity of 42000Btu, three phase power supply of 380~415V，50Hz, heat pump, DC inverter,T1 condition and refrigerant of R410a .

（3）ASD-24AI means duct type indoor unit with nominal cooling capacity of 24000Btu, single phase power supply of 220~240V，50Hz, heat pump, DC inverter,T1 condition and refrigerant of R410a .

3. Features of Products

Combining the comfort of central air conditioner and easy installation, high flexibility and suchlike advanges of high-grade small-sized split household air conditioner, SINCLAIR duct type air-conditioner unit features high efficiency, long-distance air supply, high- quality room air, reliable performance, simple operation, etc. It can be widely used in small supermarket, chain stores, living rooms, hotel, restaurant, offices, meeting room and villa.

a) **Flexible Installation:** The user can determine the air supply/return mode, condensate outflow direction and air vent type according to the needs of installation.

b) **High Efficiency and Energy Saving:** High-quality compressor is installed. The evaporator employs hydrophilic aluminum foil and inner threaded copper tube so as to ensure high efficiency of heat exchange and increased energy-efficiency ratio of the unit.

c) **Long-distance Air Supply:** For extra residual pressure design, the air can be blown to a long distance after centralized handling within the indoor unit.

d) **High- quality Room Air:** The air duct of the unit may be connected to multiple air vents so that the air-conditioning temperature and humidity within the room will be evenly distributed. To improve the room air quality, the unit is equipped with highly efficient and healthy filter in which nanometer photocatalyst or catechin is used as the filtering medium.

e) **Reliable Performance:** The unit with full functions has powerful self-diagnosis function. (See the Microcomputer Control System for detailed information).

f) **Simple Operation:** Simple controller and flexible remote controller enable control of unit as your desire.

g) **Control of Fresh Air:** 11 kinds of different fresh air flow volume can be set to adjust it accurately and reduce power consumption.

h) **Lock of Temperature Range:** The user can lock the temperature range as desired. This is suitable for public space.

i) Weekly Timer: It has the function of centralized control and can set startup and stop of the unit at 4 periods of time of each day in a week.

3.1 Microcomputer Control System SeeTable 1-1

Control Function	Protection Function	Display Functions
Memory Function	High/Low Pressure Protection	TIMER On/Off
Remote Control	Overload Protection	Fan Speed Display
Timer Function	Overcurrent Protection	Running Mode Display
Diagnosis and Alarm Function	Exhaust HighTemperature Protectio	Defrosting Display
Sleep Function	Reverse Phase Protection	Test Display
Auto Function	Antifreezing Protection	Sleeping Display
Anti Cold-air Function	High Temperature Protection	Temperature Display
Residual Heat Blowing Function	Sensor Failure Alarm	Failure Code
Control Function to Sub-rooms		
Centralized Control Function		

Control Functions:

- Memory Function (Upon reset after power failure, the unit will run under its original status without any change in mode and parameters).
- Remote Control (The unit is provided with different controllers for your option. The wired controller can receive the command from a distance up to 10 meters).
- Timer Function (The unit may be set to TIMER On / Off separately or in cycle).
- Diagnosis and Alarm Function (Upon any failure during operation, the unit will display the failure code and give out alarm).
- Energy Saving Function (The unit can automatically perform cost-effective control under energy-saving mode).
- Auto Function (When the unit is under cooling mode, the indoor fan can automatically adjust its speed according to the actual needs of the system).
- Anti Cold-air Function (Under heating mode, indoor fan will operate till indoor heat exchanger is over indoor temperature.)
- Control Function to Sub-rooms (The startup and stop of the unit can be controlled through control of switch in any sub-room.)
- Residual Heat Blowing Function (Under heating mode, the indoor fan will stop after compressor has been stopped for a period of time.)

Protection Functions:

- High / Low Pressure Protection (If the suction pressure of the compressor is too low and the exhaust pressure is two high, the compressor will be stopped and the failure code will be displayed).
- Overload Protection: (The compressor with self-heat protection will be stopped if its temperature exceeds the permissible value, and will be started as long as the temperature resumes to normal.
- Over-current Protection (When the compressor current exceeds the normal value, the compressor will be stopped and the failure code will be displayed).
- Exhaust High Temperature Protection (When the exhaust temperature of the compressor exceeds the permissible value, the compressor will be stopped and the failure code will be displayed).
- Reverse Phase (Phase Loss) Protection (If the power is inconsistent of phase sequence or phase loss, the unit will not be started and the failure code will be displayed).
- Antifreezing Protection (When the surface temperature of indoor heat exchanger is too low, the compressor will be stopped and the failure code will be displayed).
- High Temperature Protection (When the surface temperature of indoor heat exchanger is too high, the compressor will be stopped and the failure code will be displayed).
- Sensor Fault Alarm (When the sensor is in short circuit or open circuit, the failure code will be displayed).

◇ **Display Function:**

- CLOCK Display (To display and set the real time).
- Timer ON/ OFF Display (To display and set the time for auto start or stop).
- CANCEL TIMER Display (To display the timer cancellation).
- FAN SPEED Display (The fan speed is displayed in HIGH, MEDIUM or LOW).
- RUN MODE Display (Cooling, Dehumidify, Heating, Fan)
- TEST Display (Display when under test mode).
- ENERGY SAVING Display (Display when running under energy saving mode)
- TEMPERATURE Display (Display the room temperature and preset temperature)
- Failure code Display

Weekly Timer and Centralized Control Function

Weekly timer and centralized control function can be set in this unit.A centralized controller with weekly timer can control on/off and timer of up to 16 units at the same time or of every single main unit to eliminate the trouble of turning on/off it.The centralized controller of duct type unit communicates with the manual controller of a single unit through 485 method and the max. distance between them is up to 1200m.It will display serial numbers of the single unit which are decided by location of DIP switch of manual controller of the single unit.

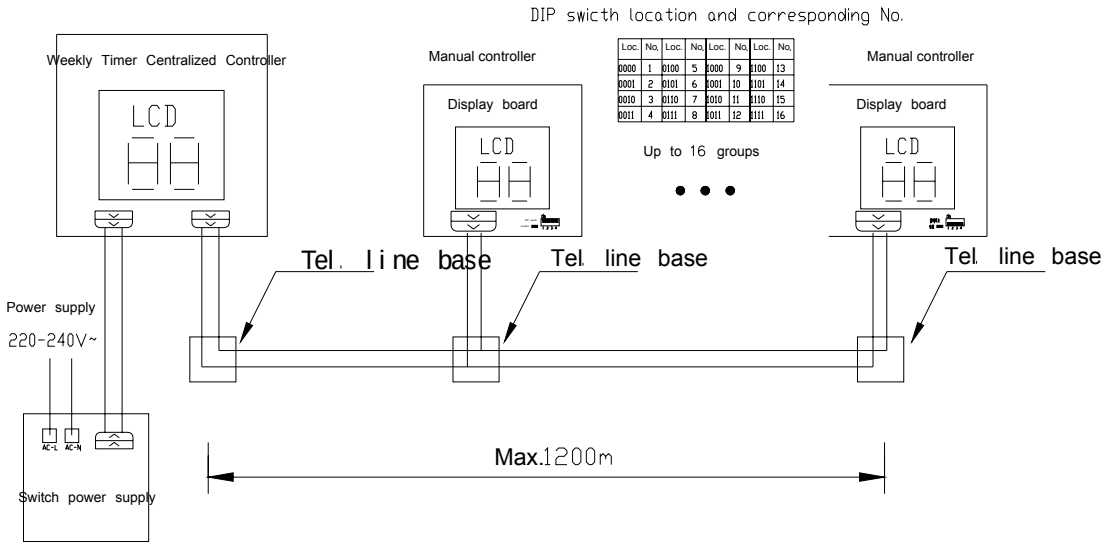


Fig.1-1

Note: Please specified whether need this control function or not before purchase.

4 Specifications and Technical Parameters

4.1 Nominal Condition and Working Temp Range

Table 4-1

Condition	Temp	Indoor air temp	Outdoor air temp
Cooling	Nominal	27°C DB / 19°C WB	35°C DB / 24°C WB
	Max.	32°C DB / 23°C WB	43°C DB / 26°C WB
	Min.	18°C DB / 14°C WB	18°C DB / —
Heating	Nominal	20°C DB / —	7°C DB / 6°C WB
	Max.	27°C DB /18°C WB	24°C DB / 18°C WB
	Min.	15°C DB / —	－7°C DB / -8°C WB

4.2 Specifications and Technical Parameters Table

4.2.1 ASGE-18AI + ASD-18AI, ASGE-24AI + ASD-24AI

Model			**ASGE-18AI ASD-18AI**		**ASGE-24AI ASD-24AI**	
Items			Cooling	Heating	Cooling	Heating
Capacity		W	5000	5800	7000	8000
Power		W	1750	1850	2450	2600
Current		A	11.5	13.5	17.5	18.7
Power supply			220-240V~ 50Hz			
Compressor			Hermetic scroll inverter compressor			
Air flow volume		m^3/h	840		1400	
Noise	Indoor	dB(A)	40		44	
	Outdoor	dB(A)	56		57	
Refrigerant			R410A			
Charge volume		kg	1.5		1.8	
Connecting pipe	Liquid	mm	ф6		ф9.52	
	Gas	mm	ф12		ф16	
Indoor unit	W	mm	1120		1345	
	D	mm	795		594	
	H	mm	266		268	
	Weight	kg	36		37	
Outdoor unit	W	mm	878		994	
	D	mm	360		428	
	H	mm	610		750	
	Weight	kg	40		56	

4.2.2 ASGE-36AI + ASD-36AI

Model			ASGE-36AI ASD-36AI	
Items			Cooling	Heating
Capacity		Capacity	10000	12000
Power		Power	3700	3800
Current		Current	17.0	17.0
Power supply			220-240V~ 50Hz	
Compressor			Hermetic scroll inverter compressor	
Air flow volume		m^3/h	2000	
Noise	Indoor	dB(A)	50	
	Outdoor	dB(A)	62	
Refrigerant			R410A	
Charge volume		kg	4.0	
Connecting pipe	Liquid	mm	φ12	
	Gas	mm	φ19	
Indoor unit	W	mm	1335	
	D	mm	834	
	H	mm	290	
	Weight	kg	57	
Outdoor unit	W	mm	1110	
	D	mm	450	
	H	mm	1385	
	Weight	kg	128	
Drainage pipe (inside diameter x wall thickness)		mm	φ20×1.5	

4.2.3 ASGE-36AI-3 + ASD-36AI, ASG-E42AI-3 + ASD-42AI

Model			ASGE-36AI-3 ASD-36AI		ASGE-42AI-3 ASD-42AI	
Items			Cooling	Heating	Cooling	Heating
Capacity		W	10000	12000	12000	14000
Power		W	3600	4000	5100	4900
Current		A	6.5	7.2	8.3	8.2
Power supply			380-415 ~ 50Hz			
Compressor			Hermetic scroll inverter compressor			
Air flow volume		m^3/h	2000		2000	
Noise	Indoor	Noise	50		50	
	Outdoor		62		63	
Refrigerant			R410A			
Charge volume		kg	4.0		4.0	
Connecting pipe	Liquid	mm	ф12		ф12	
	Gas	mm	ф19		ф19	
Indoor unit	W	mm	1335		1335	
	D	mm	834		834	
	H	mm	290		290	
	Weight	kg	57		57	
Outdoor unit	W	mm	1110		1110	
	D	mm	450		450	
	H	mm	1385		1385	
	Weight	kg	128		128	
Drainage pipe (inside diameter x wall thickness)		mm	ф20×1.5		ф20×1.5	

4.2.4 ASGE-18AI + ASF-18AI，ASGE-24AI + ASF-24AI

Model			ASGE-18AI ASF-18AI		ASGE-24AI ASF-24AI	
Items			Cooling	Heating	Cooling	Heating
Capacity		Capacity	5000	5500	7000	8000
Power		Power	2000	2400	2500	2600
Current		Current	11.5	13.5	17.5	18.7
Power supply			220-240V~ 50Hz			
Compressor			Hermetic scroll inverter compressor			
Air flow volume		m^3/h	700		1100	
Noise	Indoor	dB(A)	54		50	
	Outdoor	dB(A)	56		59	
Refrigerant			R410A			
Charge volume		kg	1.5		1.8	
Connecting pipe	Liquid	mm	ф6		ф9.52	
	Gas	mm	ф12		ф16	
Indoor unit	W	mm	836		1300	
	D	mm	695		600	
	H	mm	238		188	
	Weight	kg	27		32	
Outdoor unit	W	mm	878		994	
	D	mm	360		428	
	H	mm	610		750	
	Weight	kg	40		56	
Drainage pipe (inside diameter x wall thickness)		mm	ф30×1.4		ф20×1.5	

4.2.5 ASGE-36AI + ASF-36AI

Model			ASGE-36AI ASF-36AI	
Items			Cooling	Heating
Capacity		Capacity	10000	12000
Power		Power	3700	3800
Current		Current	17.0	17.0
Power supply			220-240V~ 50Hz	
Compressor			Hermetic scroll inverter compressor	
Air flow volume		m^3/h	1400	
Noise	Indoor	dB(A)	53	
	Outdoor	dB(A)	62	
Refrigerant			R410A	
Charge volume		kg	4.0	
Connecting pipe	Liquid	mm	φ12	
	Gas	mm	φ19	
Indoor unit	W	mm	1590	
	D	mm	695	
	H	mm	228	
	Weight	kg	42	
Outdoor unit	W	mm	1110	
	D	mm	450	
	H	mm	1385	
	Weight	kg	128	
Drainage pipe (inside diameter x wall thickness)		mm	φ20×1.5	

4.2.6 ASGE-36AI-3 + ASF-36AI，ASGE-42AI-3 + ASF-42AI

Model			ASGE-36AI-3 ASF-36AI		ASGE-42AI-3 ASF-42AI	
Items			Cooling	Heating	Cooling	Heating
Capacity		W	10000	12000	12000	14000
Power		W	3600	4000	5100	4900
Current		A	6.8	8.2	8.3	8.2
Power supply			380-415V~ 50Hz			
Compressor			Hermetic scroll inverter compressor			
Air flow volume		m^3/h	1400		1400	
Noise	Indoor	dB(A)	53		53	
	Outdoor	dB(A)	62		63	
Refrigerant			R410A			
Charge volume		kg	4.0		4.0	
Connecting pipe	Liquid	mm	ф12		ф12	
	Gas	mm	ф19		ф19	
Indoor unit	W	mm	1590		1590	
	D	mm	692		692	
	H	mm	238		238	
	Weight	kg	42		42	
Outdoor unit	W	mm	1110		1110	
	D	mm	450		450	
	H	mm	1385		1385	
	Weight	kg	128		128	
Drainage pipe (inside diameter x wall thickness)		mm	ф20×1.5		ф20×1.5	

4.2.7 ASGE-18AI + ASC-18AI， ASGE-24AI + ASC-24AI

Model			ASGE-18AI ASC-18AI		ASGE-24AI ASC-24AI	
Items			Cooling	Heating	Cooling	Heating
Capacity		W	5000	5800	7000	8000
Power		W	2000	2400	2500	2600
Current		A	11.5	13.5	17.5	18.7
Power supply			220-240V~ 50Hz			
Compressor			Hermetic scroll inverter compressor			
Air flow volume		m^3/h	680		1180	
Noise	Indoor	Noise	47		47	
	Outdoor		56		59	
Refrigerant			R410A			
Charge volume		kg	1.5		1.8	
Connecting pipe	Liquid	mm	φ6		φ9.52	
	Gas	mm	φ12		φ16	
Indoor unit	W	mm	600		840	
	D	mm	600		840	
	H	mm	230		240	
	Weight	kg	20		30	
Outdoor unit	W	mm	878		994	
	D	mm	360		428	
	H	mm	610		750	
	Weight	kg	40		56	
Drainage pipe (inside diameter x wall thickness)			φ30×1.4		φ20×1.5	

4.2.8 ASGE-36AI + ASC-36AI

Model			ASGE-36AI ASC-36AI	
Items			Cooling	Heating
Capacity		W	10000	12000
Power		W	3700	3800
Current		A	25.1	26.2
Power supply			220-240V~ 50Hz	
Compressor			Hermetic scroll inverter compressor	
Air flow volume		m^3/h	1600	
Noise	Indoor	dB(A)	53	
	Outdoor	dB(A)	62	
Refrigerant			R410A	
Charge volume		kg	4.0	
Connecting pipe	Liquid	mm	φ12	
	Gas	mm	φ19	
Indoor unit	W	mm	840	
	D	mm	840	
	H	mm	320	
	Weight	kg	38	
Outdoor unit	W	mm	1110	
	D	mm	450	
	H	mm	1385	
	Weight	kg	128	
Drainage pipe (inside diameter x wall thickness)		mm	φ20×1.5	

4.2.9 ASGE-36AI-3 + ASC-36AI, ASGE-42AI-3 + ASC-42AI

Model			ASGE-36AI-3 ASC-36AI		ASGE-42AI-3 ASC-42AI	
Items			Cooling	Heating	Cooling	Heating
Capacity		Capacity	10000	12000	12000	14000
Power		Power	3600	4000	5100	4900
Current		Current	8.5	9.5	11.6	11.0
Power supply			380-415V~ 50Hz			
Compressor			Hermetic scroll inverter compressor			
Air flow volume		m^3/h	Air flow volume		1650	
Noise	Indoor	Noise	53		53	
	Outdoor		62		63	
Refrigerant			R410A			
Charge volume		kg	4.0		4.0	
Connecting pipe	Liquid	mm	ф12		ф12	
	Gas	mm	ф19		ф19	
Indoor unit	W	mm	840		840	
	D	mm	840		840	
	H	mm	320		320	
	Weight	kg	38		38	
Outdoor unit	W	mm	1110		1110	
	D	mm	450		450	
	H	mm	1385		1385	
	Weight	kg	128		128	
Drainage pipe (inside diameter x wall thickness)		mm	ф20×1.5		ф20×1.5	

Note：

1.The cooling capacity was tested under nominal condition corresponding to the unit external standard residual pressure. The parameters are subject to that on nameplate.

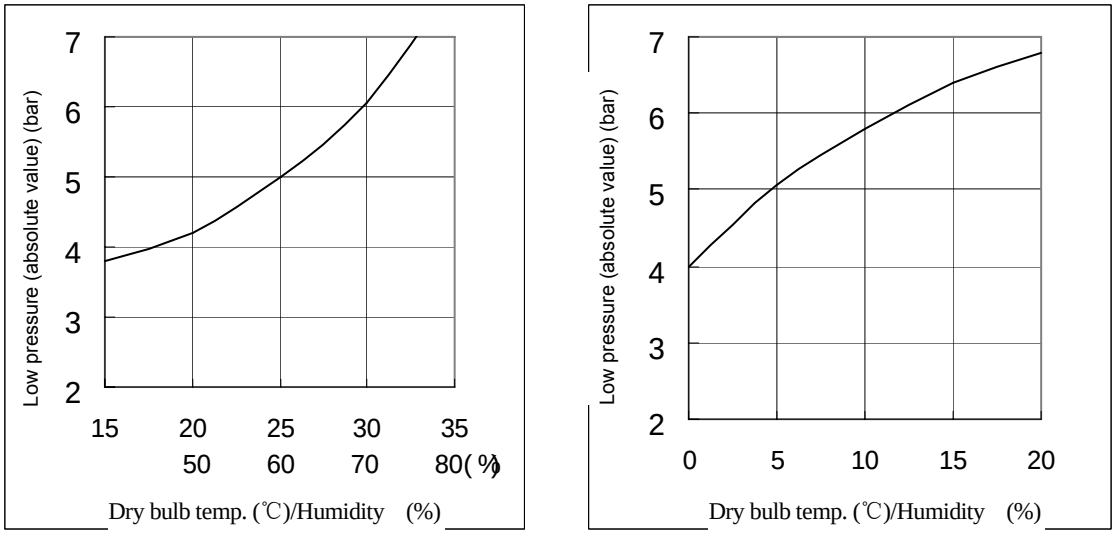
2.The noise was measured in semi-anechoic room. In actual operation, it may be higher due to change of environment.

5. Characteristics Curve

5.1 Relationship between Air-Conditioner Low Pressure and Temperature (Fig. 3-1)

Cooling running: There is the same condition indoors and outdoors.

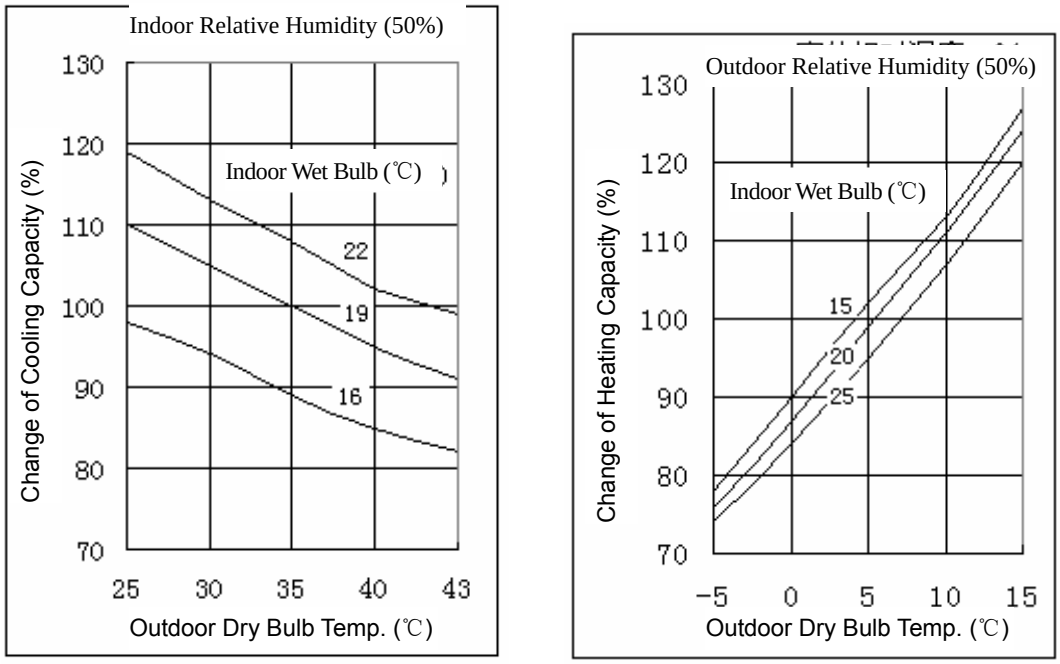
Heating running: Indoor condition, dry bulb of 21°C, wet bulb of 15.5°C.



(a) Cooling operation (b) Heating operation

Fig.3-1

5.2 Performance Curve（Fig.3-2）

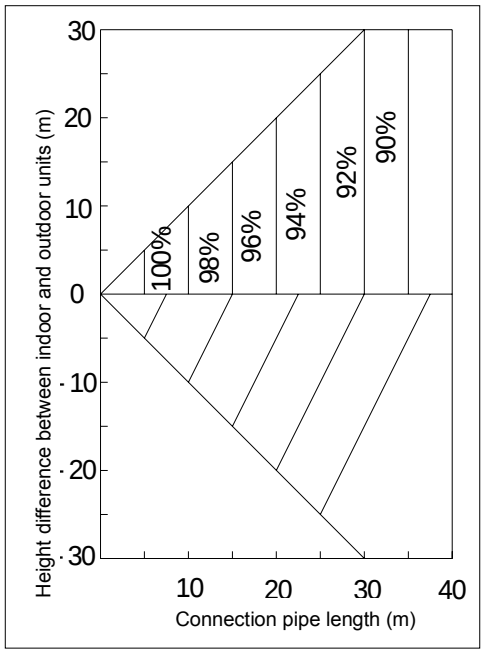


(a) Cooling Characteristics (b) Heating Characteristics

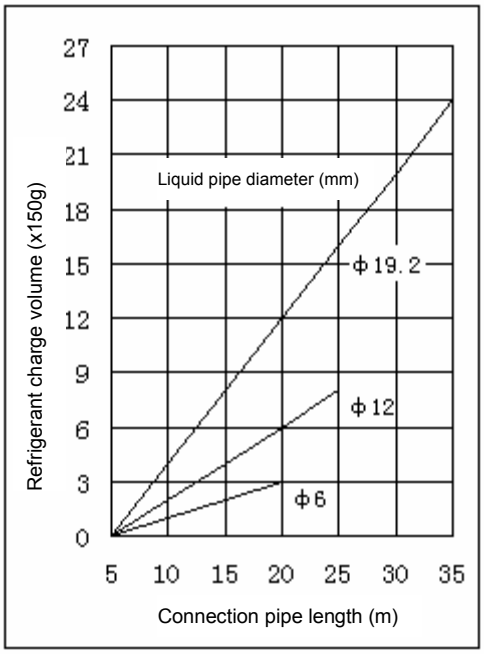
Fig. 3-2

5.3 Relationship between Cooling Capacity / Refrigerant Charge and Connection Pipe Length

(Fig. 3-3)

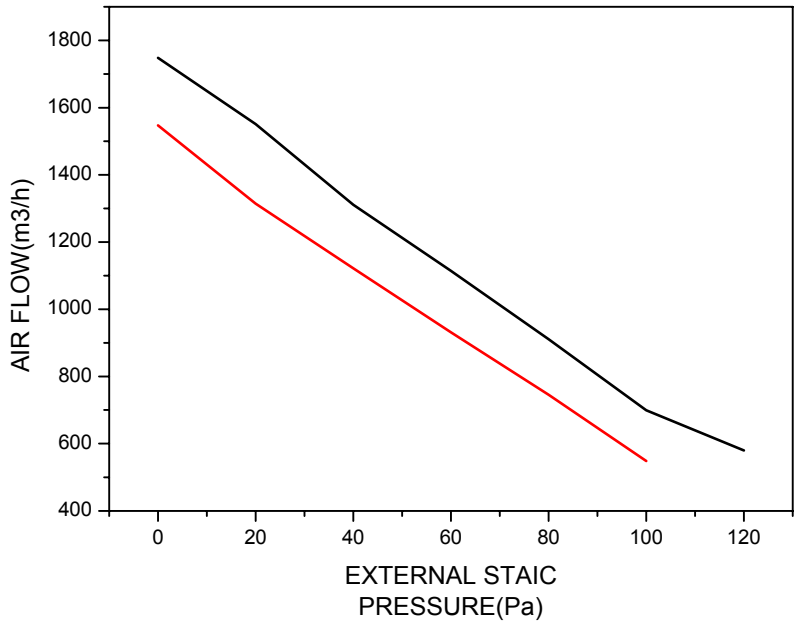


(a) Change of cooling capacity with that of connection pipe length

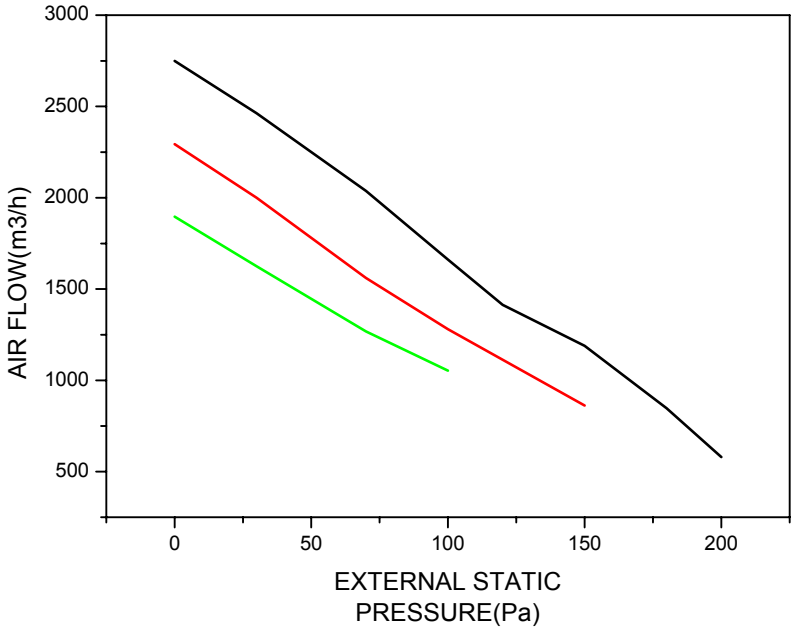


(b) Change of refrigerant charge volume with that of connection pipe length

5.4 Relationship between Air Flow and Static Pressure



(a) ASGE-24AI and ASD-24AI

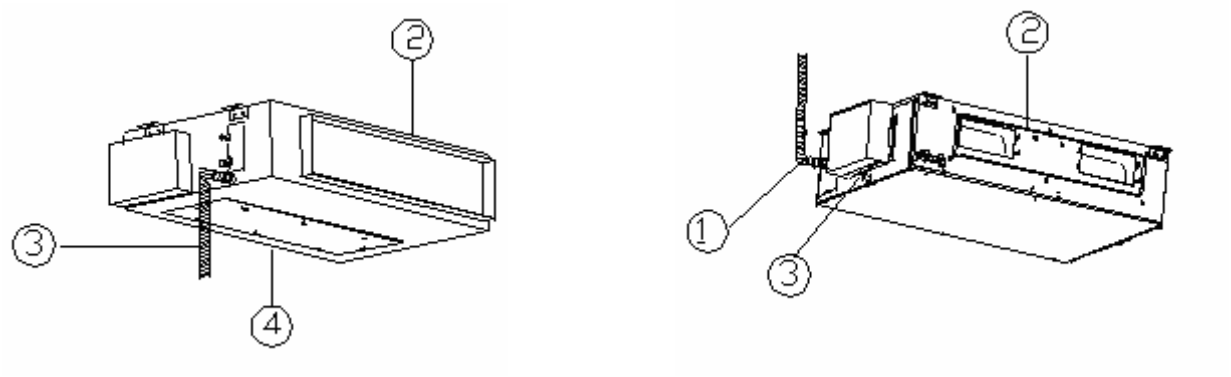


(b) ASGE-36AI-3 / ASGE-36AI, ASD-36AI

ASGE-42AI-3, ASD-42AI

6. Main Parts

6.1 Sketch of Structure of Unit



(a) 09～18kBtu indoor unit (b) 24～60kBtu indoor unit

Fig. 4-1Indoor Unit

Note:

1——Condensate pipe of drainage pump 2——Rectangle air outlet

3——Condensate pipe of water tray 4——Air Inlet

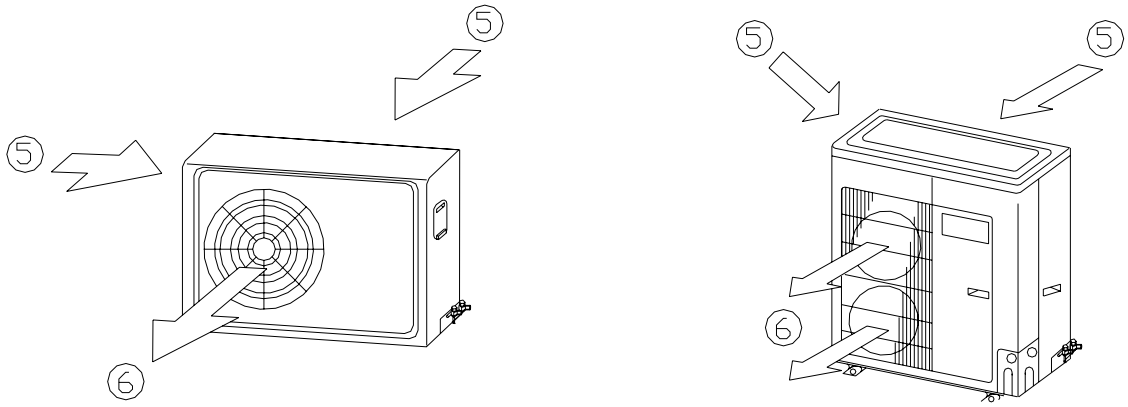


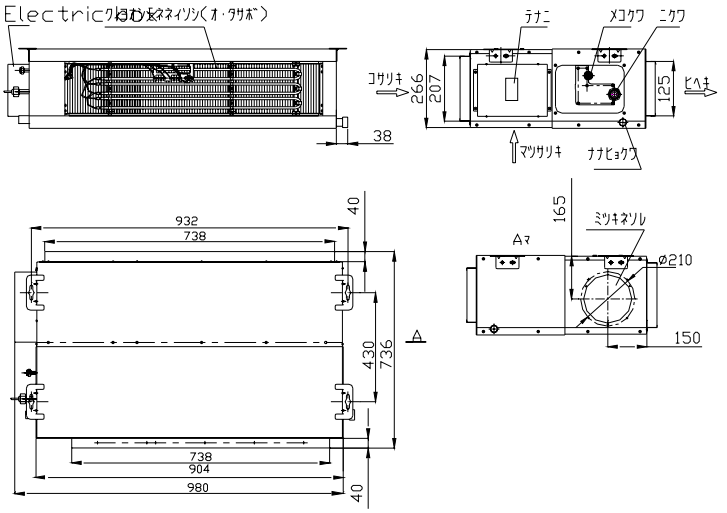
Fig. 4-2 Outdoor Unit

Note: 5——Air inlet 6——Air outlet

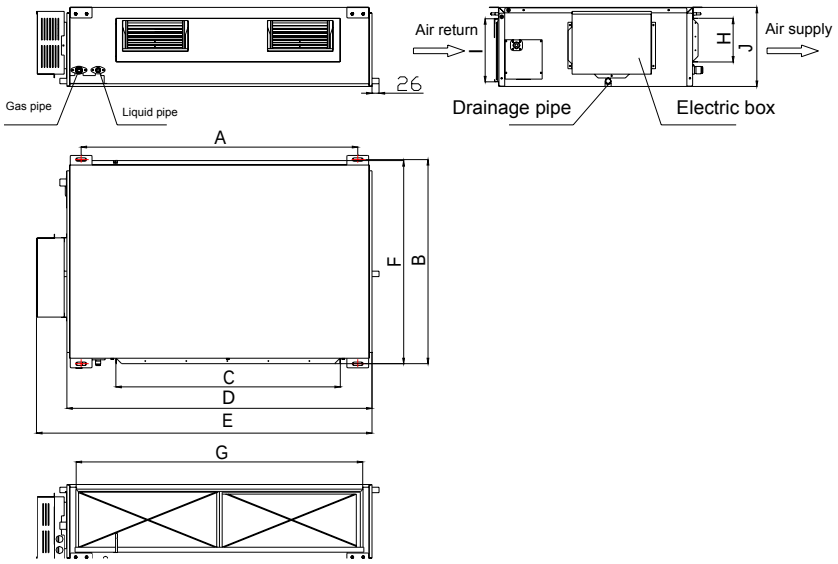
7. Outline and Installation Dimension

7.1 Outline and Dimension of Indoor Unit (Fig.5.1)

Duct type indoor unit



(a) ASD-18AI



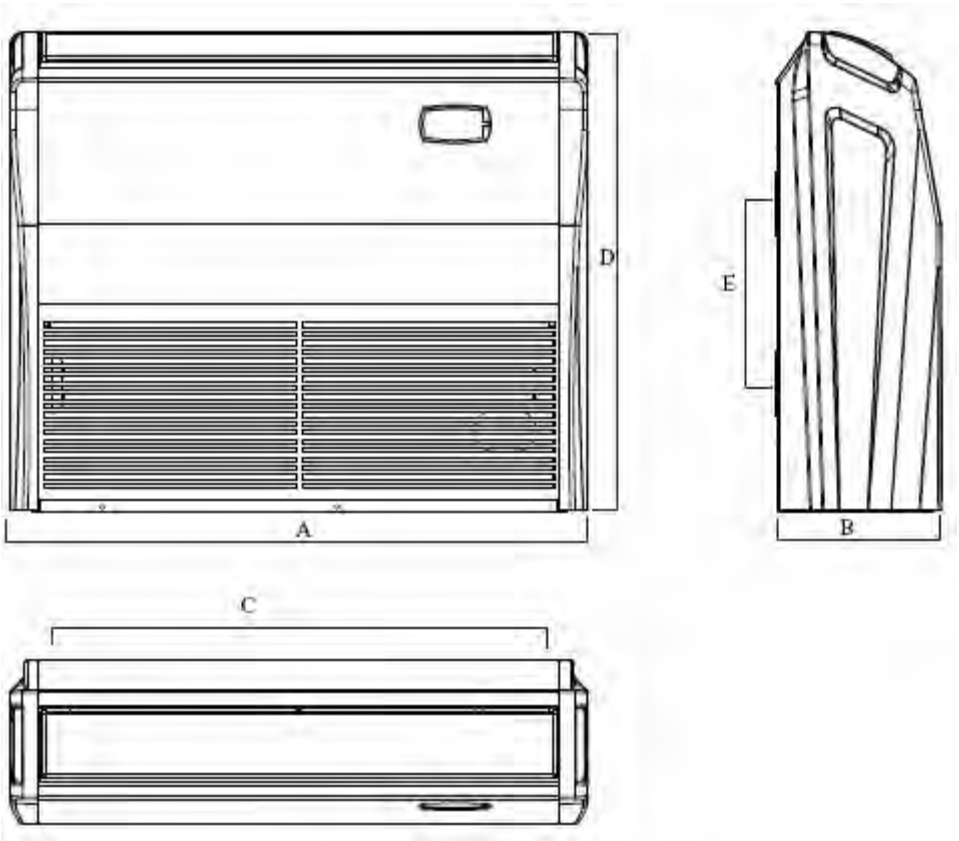
Unit： mm

Items / Models	A	B	C	D	E	F	G	H	I	J	Liquid pipe	Gas pipe	Drainage pipe (out diameter×wall thickness)
ASD-24AI	1063	505	820	1159	1247	504	1088	160	211	268	Φ9.52	Φ16	Φ20×1.5
ASD-36AI	1011	748	820	1115	1226	744	1047	160	231	290	Φ12	Φ19	Φ20×1.5
ASD-42AI	1011	748	820	1115	1226	744	1047	160	231	290	Φ12	Φ19	Φ20×1.5

（b）Other models

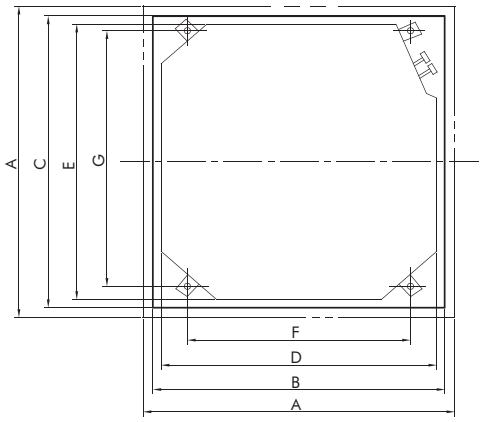
Fig. 5-1 Outline and Dimesion of Indoor Unit

Floor ceiling type unit

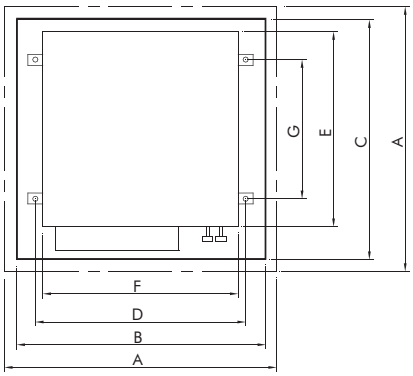


Model	A	B	C	D	E
ASF-18AI	836	238	745	695	260
ASF-24AI	1300	188	1202	600	260
ASF-36AI,ASF-36AI-3	1500	238	1491	695	260
ASF-423AI-3					

Cassteet Type



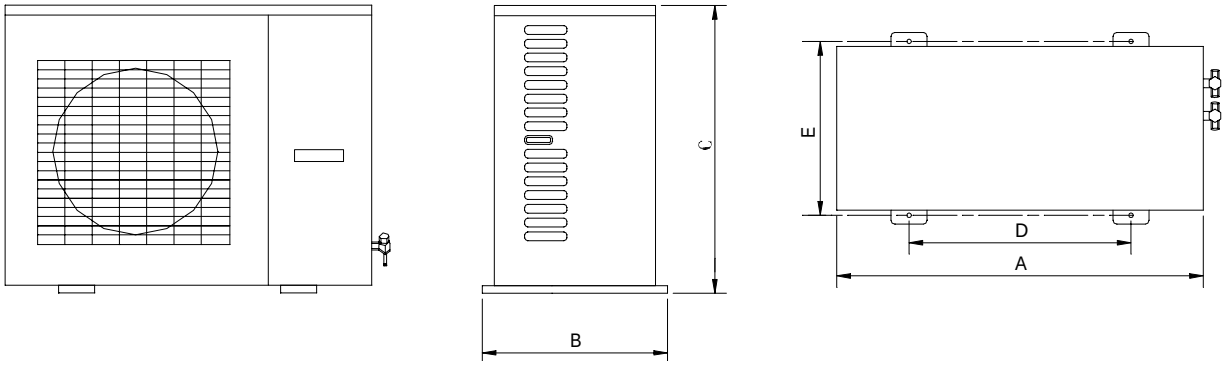
ASC-24AI
ASC-36AI
ASC-42AI



ASC-18AI

Item / Model	A	B	C	D	E	F	G
ASC-18AI	650	640	646	606	580	580	400
ASC-24AI	950	890	890	840	840	680	780
ASC-36AI(-3)							
ASC-42AI-3							

7.2 Outline and Dimension of Outdoor Unit（Fig.5-2）



Unit：mm

Unit / Model	ASGE-18AI	ASGE-24AI	ASGE-36AI ASGE-42AI	ASGE-36AI-3 ASGE-42AI-3
A	848	950	950	
B	320	412	412	
C	540	700	1250	
D	540	572	572	
E	286	378	378	

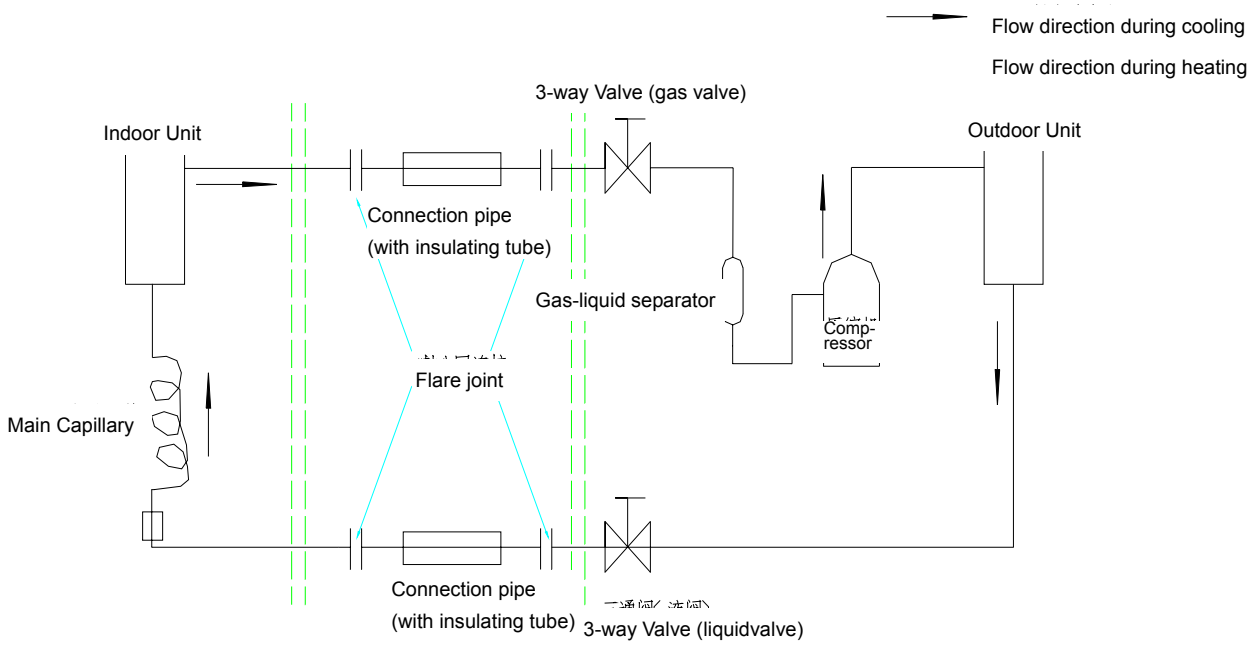
Fig. 5-2 Outline and Dimesion of Outdoor Unit

8. Refrigeration System Principles

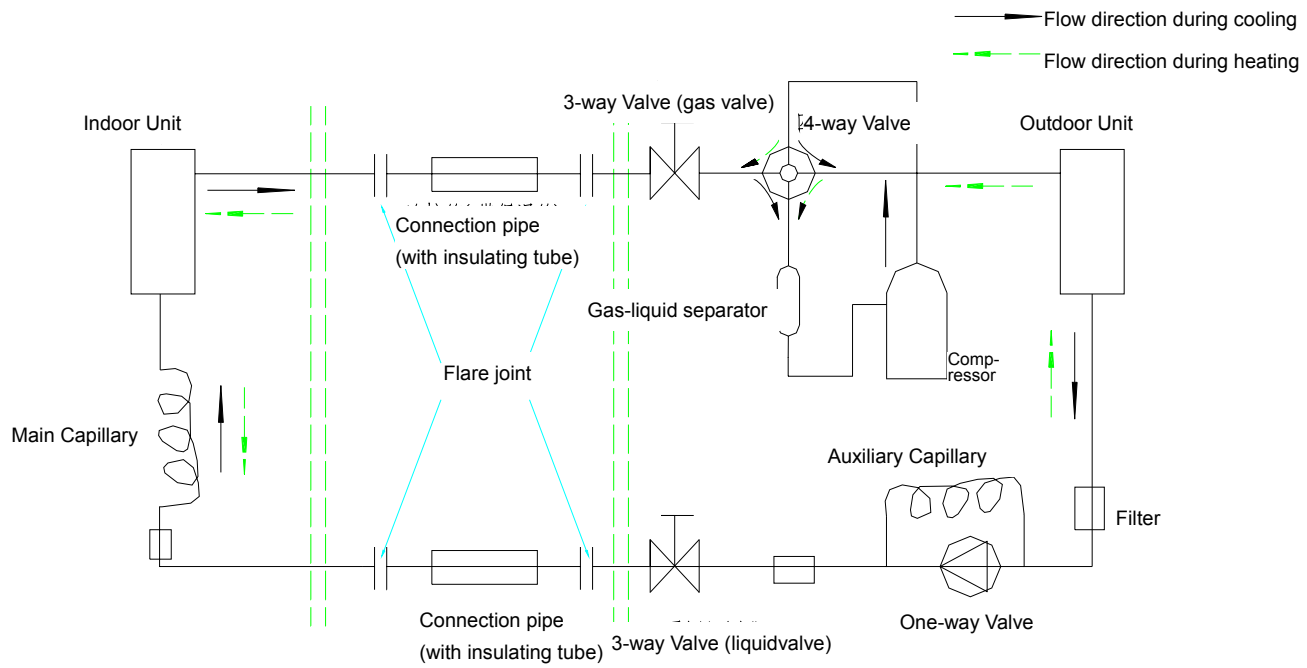
Refrigeration Cycle: The low-temperature and low-pressure refrigerant vapour in the evaporator is compressed into high-temperature and high-pressure gas by the compressor, and then the gas enters into condenser.The gas becomes high-temperature and high-pressure liquid through heat exchange with outdoor air, and then the liquid passes through the capillary for cooling and decompression by throttling and enters into evaporator.After that, the gas-liquid refrigerant in the envopator is completely evaporated to cool the indoor air.The vapour out of the evaporator is re-compressed by the compressor. So is the above procedure recycled that the cooled air in the duct is contiuously sent to air-conditioning area with the help of fan motor.

Heating Cycle: It is reverse to cooling cycle。In this case, 4-way valve will reverse and flow direction of refrigerant changes, i.e the vapour out of the compressor enters into heat exchanger for condensation. The refrigerant after condensation passes through the capillary for throttling.After that it evaporates in the outdoor heat exchanger, at last it will be sucked and compressed by compressor. So is the above procedure recycled that the hot air in the duct is contiuously sent to air-conditioning area with the help of fan motor.

Working Principle of the Unit:



(a) Working principle of cooling only unit

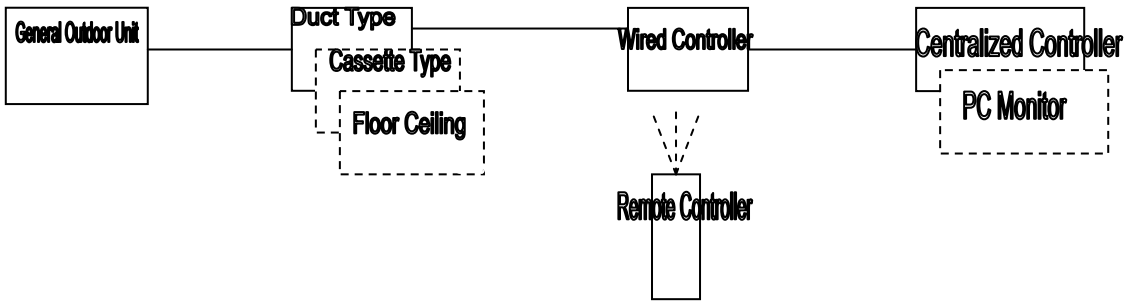


(b) Working principle of heat pump unit

Fig. 6-1

Chapter II Control Functions

1. Control Mode



The 4-in-1 DC Inverter Unit consists of outdoor mainboard, indoor mainboard and manual controller, which are lined via communication wires. In this way, one outdoor unit can be used with different indoor units of the equal capacity (duct type unit, floor ceiling unit, cassette type unit and ceiling type unit), and the cooling and heating share one electronic expansion valve.

The outdoor compressor is DC inverter compressor, in which the advanced sine wave control mode is used, featuring in low vibration, low noise and high efficiency. The single-phase unit also uses the PFC control, with PFC value up to 0.99 or higher, so the interference to the electric grid is very low.

The outdoor unit also applies the advanced PI algorithm, able to automatically and quickly adjust the working frequency of the compressor according to the change of indoor loads. This can not only meet the user's requirements for comfort but also save unnecessary electric energies.

This unit can be controlled via LCD controller easily or controlled from remote controller. It can also be controlled from centralized controller, or put under remote monitor by PC computer. Besides, it can also be configured with weekly timer wired controller which can automatically switch on or off the unit at predefined time for each day in a week. This is suitable to family, office, factory and man-free places.

2 Introduction Control Functions

2.1 Basic Control Functions

2.1.1 Cooling Mode

After setting to cooling mode, the indoor fan will run at preset speed after 3 seconds and the outdoor unit will start to calculate the system load demand. If the load is "0", the other loads except the indoor fan and indoor drainage pump will not be put into operation. If the load is over "0", the electronic expansion valve will be firstly opened and then the outdoor fan is started. After 30 seconds, the compressor is started.

Under cooling mode the range of temperature setting is 16℃~30℃and the initial value is 26℃

2.1.2 DRY Mode

The DRY mode is basically same as the cooling mode. The difference is that: The speed of indoor fan is fixed at low speed; and The maximum value of capacity output is 90%.

Under DRY mode, the range of temperature setting is 16°C~30°C and the initial value is 24°C.

2.1.3 Heating Mode

After setting to heating mode, the outdoor unit will start to calculate the system load demand. If the load is “0”, all the other loads will not be put into operation. If the load is over “0”, the electronic expansion valve will be firstly opened and then the outdoor fan is started. After 30 seconds, the compressor is started, the 4-way valve is energized and the indoor fan runs under anti cold air mode.

Under DRY mode, the range of temperature setting is 16°C~30°C and the initial value is 20°C.

2.1.4 Fan Mode

When the indoor unit is set to fan mode, all the loads of the outdoor unit will be stopped and the indoor fan will run at preset speed. Under this mode, the fault is detected but will not be treated. The temperature is not adjustable, displayed at 26°C.

2.1.5 Auto Mode

Under this mode, the run mode will vary with the ambient temperature according to the following conditions:

When $T_{amb.}$＞26°C, the unit will run under cooling mode and the preset temperature is 26°C;

When 20°C≤$T_{amb.}$≤26°C, the unit will run under DRY mode and the preset temperature is 24°C;

When $T_{amb.}$＜20°C, the unit will run under heating mode and the preset temperature is 20°C. When $T_{amb.}$ ≥24°C, the unit will exit the heating mode. For cooling-only unit, when $T_{amb.}$＜20°C, the unit will run under fan mode and the preset temperature is 20□. When $T_{amb.}$≥24°C, the unit will exit the fan mode.

Once the mode is activated, the unit will run 30 seconds the shortest before it switch the run status under auto mode according to the ambient temperature.

2.2 Special Control Functions

2.2.1 Energy-saving Function

Set a upper and lower limit of temperature by using manual controller, so that the temperature of air conditioner is set to an energy-saving range, thus to save the power consumption of the air conditioner. For example, the temperature under cooling mode is defaulted 16～30°C, but the user may customize it to 26～30°C by using manual controller. In this range, the lowest setting is 26°C other 16°C.

2.2.2 Memory Function

Upon re-energization after power shutdown or failure, the air conditioner can memorize the last work mode, temperature setting, fan speed and other parameters, so that it is not necessary to repeat setting of those parameters. The user may also inactivate this function by using manual controller.

2.2.3 Timer Function

For easy control of the air conditioner, the user may set the air conditioner to timer on or timer off by using the manual controller. The timer is available with two modes for user’s option, i.e. countdown and 7-day time section.

2.2.4 Sleep Function

If the user requires air conditioner during sleep, this function may automatically increase or decrease the preset temperature, so as to meet the users' needs for comfort and also save the energy. If used with timer function, the energy saving effect will be better.

2.2.5 Alarm Function

When the air conditioner is abnormal, it can automatically display the fault or protection type, while triggering the sound and lighting alarm.

2.2.6 Week Timer Centralized Control Function

The user may select centralized controller to control 16 units simultaneously for their start/stop, timer on/off each day and key shield. The function is powerful, particularly suitable to long-distance air conditioner system with many units.

2.2.7 Remote Monitor Function

By selecting the remote monitor function, the user may monitor the working parameters and control the run mode of the air conditioner from a family PC. This is suitable to centralized control of air conditioners in hotel, restaurants and factory. Up to 254 sets of units may be monitored simultaneously.

2.2.8 Fresh Air Function (Duct Type Unit)

This function is suitable to duct type unit and helpful to introduce outdoor fresh air and enhance the user's comfort during use of the air conditioner. It is a truly air conditioning system.

2.2.9 Drainage Function (Duct Type Unit)

This function is suitable to duct type unit and helpful to extend the applications of the air conditioner. By this function, the installation of air conditioner will no longer be restricted.

2.2.10 Air Valve Control Function (Duct Type Unit)

This function is suitable to duct type unit. By this function, the unit may be connected to 8 air valve controllers. The fan speed is controlled by controlling the number of air valves that will be opened or closed, thus to meet the needs of each room for air flow.

2.3 Protection Function

2.3.1 High Pressure Protection

When high pressure protection is detected, the unit will shut down all the loads (except the 4-way valve of heating) and shield all the keys and remote signals except the On/Off, in which case the run indicator will blink (or display fault code E1) and the buzzer will alarm. The fault cannot be restored automatically. You shall need to press ON/Off to stop the unit, then turn off the indicator (or clear E1 display) before pressing ON/OFF. The unit will be restarted if the high pressure protection disappears. Otherwise, the run indicator will blink (or display fault code E1) and the buzzer will alarm.

2.3.2 Low Pressure Protection

No matter the unit is under ON or standby status, it will be deemed low-pressure protection as long as it is detected that the low-pressure switch is cut off, in which case the indicator will blink (or display E3), all the loads will be stopped (except the 4-way valve of heating). If the fault is eliminated, the compressor will be restarted after 3 minutes. If three low-pressure faults of compressor are detected successively in 30 minutes from the first detection to the occurrence of fault, the indicator will blink (or display E3) and the buzzer will alarm. The unit cannot be restored automatically. You shall need to press ON/Off to stop the unit, then turn off the indicator before pressing ON/OFF. The unit will be restarted if the high pressure protection disappears. Otherwise, the run indicator will blink (or display fault code E3) and the buzzer will alarm.

2.3.3 Exhaust Overtemperature Protection

After the compressor is started, if it is detected that the compressor overload switch is cut off, it will be deemed compressor overload protection. In this case, the indicator will blink (or display E5), all the loads will be stopped (except the 4-way valve of heating). If the fault is eliminated, the compressor will be restarted after 3 minutes. If three compressor overload protections are detected successively in 30 minutes from the first detection to the occurrence of fault, the compressor cannot be resumed automatically and the buzzer will alarm. You shall need to press ON/Off to stop the unit and clear the sound alarm before pressing ON/OFF again. The unit will be restarted if the high pressure protection disappears. Otherwise, the run indicator will blink (or display fault code E5) and the buzzer will alarm.

2.3.4 Overload Protection

The temperature of outdoor heat exchanger will be detected during cooling and the temperature of indoor heat exchanger will be detected during heating. When the temperature of heat exchanger exceeds the normal working temperature permissible to the unit, it may be reduced by adjusting the compressor frequency or stopping the unit.

2.3.5 Sensor Fault Protection

The unit will perform real-time detection of the indoor room sensor, evaporator sensor, outdoor ambient sensor, compressor exhaust sensor and condenser sensor are normally connected. If the controller detects that any sensor is connected abnormal (in open circuit or short circuit), it will send out fault signal and the fault code will be displayed on indoor panel or lamp panel. Except that the unit will not be stopped upon the fault of room ambient sensor, the fault of other sensors

will result in stop of the unit.

2.3.6 Anti-freeze Protection

If the temperature of indoor heat exchanger is too low under cooling mode, frost might occur and thus affect the cooling effect. This unit is provided with antifreeze protection, so that the frost may be automatically eliminated to ensure the unit is under the best performance.

3. Wired Controller, Remote Controlled and Week Timer Centralized Controller

3.1 User Guideline for Wired Controller

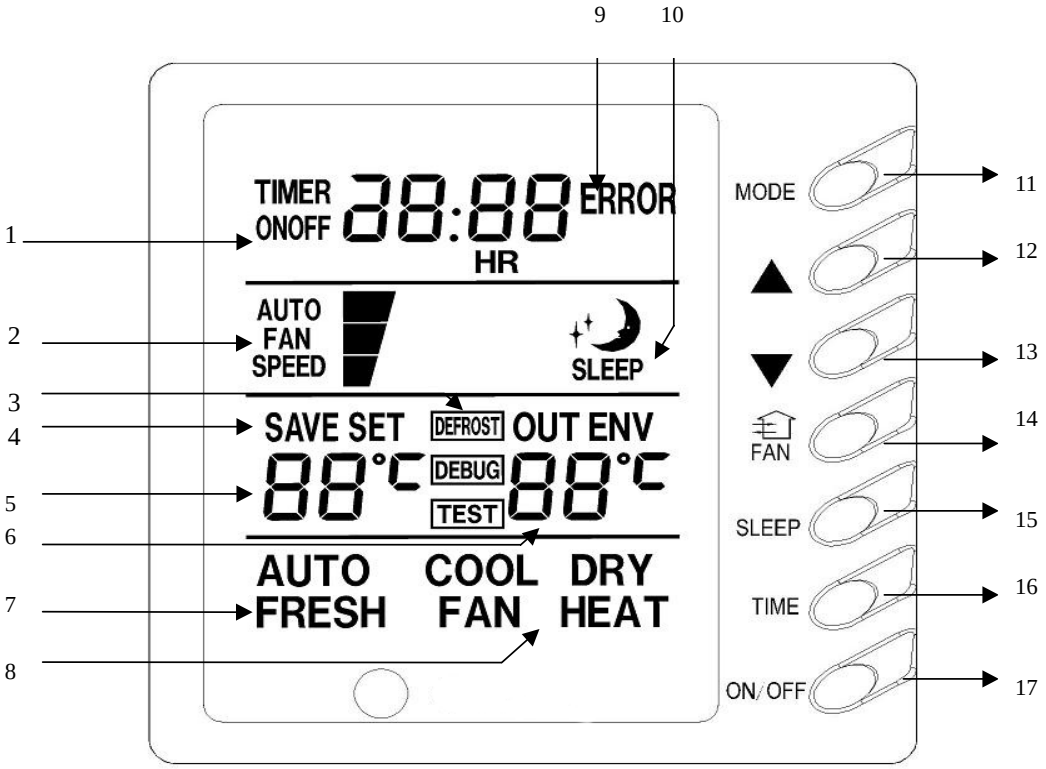


Fig. 1

Component of Wired Controller			
1	TIMER display	10	SLEEP mode display
2	Display of fan speed (AUTO, HI, MED, LOW)	11	MODE Button
3	Display of DEFROST status	12	For increase of temperature setting
4	Display of energy-saving status	13	For decrease of temperature setting
5	Display of temperature setting	14	Fan button
6	Display of ambient temperature	15	SLEEP button
7	Display of fresh air status	16	TIMER button
8	Mode (COOLING, DRY, FAN, HEAT, AUTO)	17	ON/OFF button
9	Display of fault status		

1) ON/OFF (Fig. 2)
2) Press ON/OFF button to start the air conditioner.
3) Press ON/OFF button again to stop the air conditioner.

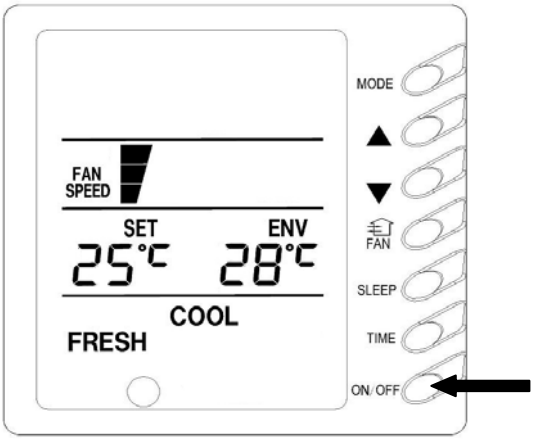


Fig. 2

2) Fan control (Fig. 3) (Shown in the figure is relevant area of display. Same as below).

❖ With each press of FAN button, the fan speed wil change in a sequence as below:

→ LOW→MED→HI→AUTO→

❖ Under DRY mode, the fan speed will be automatically set to LOW.

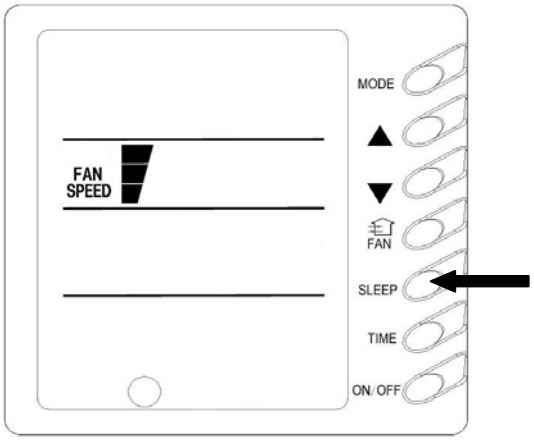


Fig. 3

3) Temperature adjustment (Fig. 4)

❖ Press the temperature adjustment key.

▲:For increasing temperature setting;

▼:For decreasing temperature setting

(Each press of this key will increase or decrease the temperature by 1□).

Note: Key Lock Function: If you hold down both ▲ and ▼ for 5 seconds, “EE” will be displayed at the position of temperature setting and all the keys will be locked. If you hold down both ▲ and ▼ for 5 seconds again, the key lock function will be deactivated.

When the remote monitor or centralized controller shields the display, the key of the display and the signal of remote controller will be shielded also. In this case, “CC” will be displayed at position of temperature setting

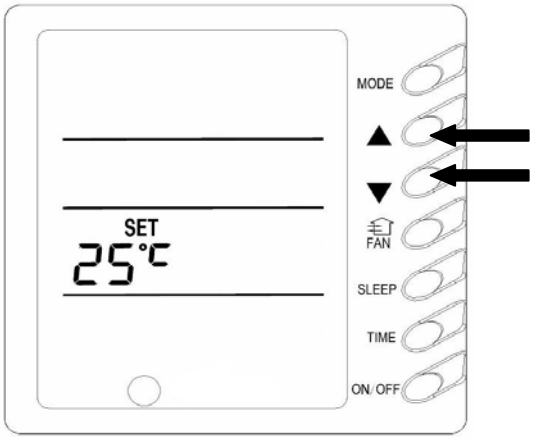


Fig. 4

❖ The range of temperature setting under different modes is :

Heat -------- 16°C～30°C
Cool -------- 16°C～30°C
DRY -------- 16°C～30°C
Fan -------- Temperature setting deactivated
Auto Mode ----------16°C～30°C

4) SLEEP setting (Fig. 5)

If the controller is under Cooling or DRY mode, the temperature setting will increase by 1°C one hour after pressing SLEEP key and by another 1°C after 2 hours. Then, the unit will run at this temperature.

If the controller is under heating mode, the temperature setting will decrease by 1°C one hour after pressing SLEEP key and by another 1°C after 2 hours. Then, the unit will run at this temperature.

There is no SLEEP function under FAN mode.

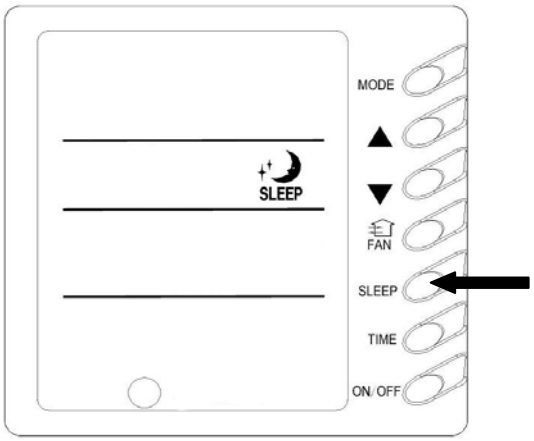


Fig. 5

5) Run Mode Setting (Fig. 6)

❖ With each press of this key, the run mode will change in the following sequence:

→ COOL→DRY→FAN→HEAT→AUTO

❖ Under “COOL” mode, the COOL display will be light up, and the temperature setting must be lower than the room temperature. If the setting temperature is higher than the room temperature, the unit will not run at COOL mode.

❖ At “DRY” mode, the DRY display will be light up. Fan motor will run at low fan speed in a specific temperature range. The dehumidifying effect under this mode is better than that under COOL mode and it is more energy saving.

❖ At “HEAT” mode, the HEAT display will be light up. The temperature setting must be higher than the room temperature. If the temperature setting is lower than the room temperature, the HEAT mode operation will not be activated.

❖ At FAN mode, the fan display will light up. The unit will automatically adjust the run mode according to ambient temperature.

❖ The auto mode is shielded after setting to energy-saving mode.

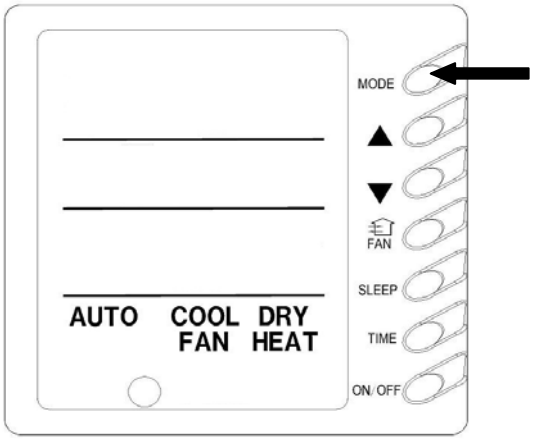


Fig. 6

❖ Under HEAT Mode, frost will occur on the outdoor unit if the outdoor temperature is low and humidity is high. This will result in reduced heat efficiency. in this case, the controller will automatically activate the defrost function and the DEFROST will appear. Note: There is no HEAT mode for cooling-only unit.

6) Timer Setting (Fig. 7)

You may set the auto start time under OFF status and set auto stop time under ON status. After pressing TIMER key, the unit will be under timer setting status and the TIMER will blink. In this case, the user may press "▲" or "▼" to increase or decrease the time. Press the TIMER again to validate the timer, so that the unit will start to count the time. When the unit is under timer status, you may press TIMER to cancel the timer.
Range of setting: 0.5 ~ 24 hours

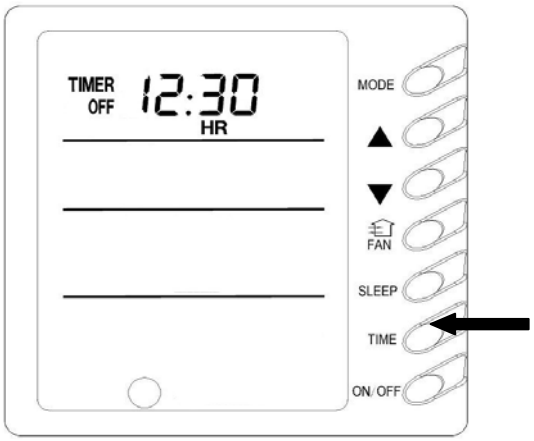


Fig. 7

7) Setting of Fresh Air Valve (Fig. 8)

Under stop status, you may hold down FAN SPEED key for 5 seconds to call out the fresh air setting.
In this case, the FRESH AIR will blink on LCD, and the exiting fresh air mode will be displayed in temperature setting area. The user may press "▲" or "▼" to adjust the fresh air mode. The number definition is as follows:
00——Always under closed statue
01——The fresh air valve will open for 6 minutes if the unit is started 60 minutes continuously.
02——The fresh air valve will open for 12 minutes if the unit is started 60 minutes continuously.
03——The fresh air valve will open for 18 minutes if the unit is started 60 minutes continuously.
04——The fresh air valve will open for 24 minutes if the unit is started 60 minutes continuously.
05——The fresh air valve will open for 30 minutes if the unit is started 60 minutes continuously.
06——The fresh air valve will open for 36 minutes if the unit is started 60 minutes continuously.
07——The fresh air valve will open for 42 minutes if the unit is started 60 minutes continuously.
08——The fresh air valve will open for 48 minutes if the unit is started 60 minutes continuously.
09——The fresh air valve will open for 52 minutes if the unit is started 60 minutes continuously.
10—Fully open
Press ON/OFF to confirm after adjusting the fresh air

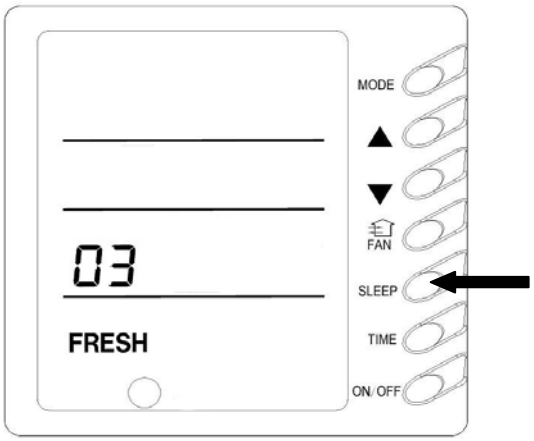


Fig. 8

mode, so that the system will store this number. After that, the unit will run per this fresh air mode. The factory default value is “0” and the fresh air valve is closed. If starting the unit in this case, there will be no display of FRESH AIR on LCD.

If the user has set the fresh air mode (1-10), the FRESH AIR will always appear on LCD as long as the unit is running, regardless of the system run mode.

The data of fresh air setting will not be cleared upon re-energization after de-energization.

8) Energy-saving Setting (Fig. 9)

Under stop status, hold down FAN SPEED + “▼” key simultaneously for 5 seconds to call out the energy-save setting menu. In this case, the “ENERGY SAVING SETTING” “COOLING” will appear, (For the first setting, the initial value 26□ is displayed), the lower limit temperature will be displayed in the temperature setting area and the temperature being set will be displayed by flash., Use “▲” and “▼” to set the lower limit of the cooling temperature (range: 16 – 30) and press ON/OFF to confirm. Use “▲” and “▼” to set the upper limit of cooling temperature ad display at position of ambient temperature (range of setting: 16 – 30). Press ON/OFF to confirm.

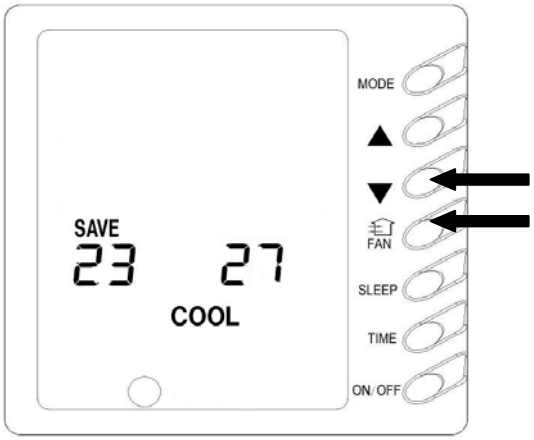


Fig. 9

Take care that the upper limit temperature shall not be lower than the lower limit temperature. If the upper limit temperature shall not be lower than the lower limit temperature, the system will default the higher as the upper limit and the smaller as the lower limit. Press MODE to complete the energy-saving setting under cooling and dehumidify mode and switch to energy-saving setting under heating mode (This function unavailable for cooling-only unit). In this case, ENERGY SAVING SETTING and HEAT will be displayed. After completing the setting, hold FAN SPEED + “▼” key for 5 seconds again to exit the energy-saving setting. After calling out the energy-saving setting interface, if there is no operation within 10 seconds after the system has responded to the last press, the system will pop up this menu and display the normal stop interface.

After completing the above setting, the ENERGY-SAVING will appear on LCD upon next start of the system. No matter the user operates the unit via displayer or from remote controller, the temperature

setting shall not exceed the range of energy-saving setting. For example in Fig. 9, if we set the lower limit of cooling temperature to 23□ and the upper limit to 27□, the user can only set the cooling temperature between 23□ and 27□ by using remote controller and pressing from display.

If the upper limit temperature is same as the lower limit temperature, the system can only run at this temperature under corresponding mode.

After the energy-saving mode is activated, you may hold FAN SPEED + "▼" key for 5 seconds under stop status to deactivate the energy-saving setting, but the value you have set before cannot be cleared and it will be used as the initial temperature for the next energy-saving setting.

After a power failure, the energy-saving setting will be memorized and it will still play the function upon next energization.

After setting the energy-saving mode, the sleep mode and auto mode will be shielded.

9) Display of Outdoor Environment Temp. (Fig. 10)

Under normal condition, only the indoor room temp. is displayed in Environment space. Under start or stop status, you may hold SLEEP for 5 seconds to display Outdoor Environment on LCD.

① If the outdoor environment temperature is positive, there will be no display in temperature space. The outdoor environment temperature detected inside the system will be displayed in the space where the original environment temperature is displayed.

② If the outdoor environment temperature is negative, the "-" will be displayed on the next digit of temperature space. The outdoor environment temperature detected inside the system will be displayed in the space where the original environment temperature is displayed.

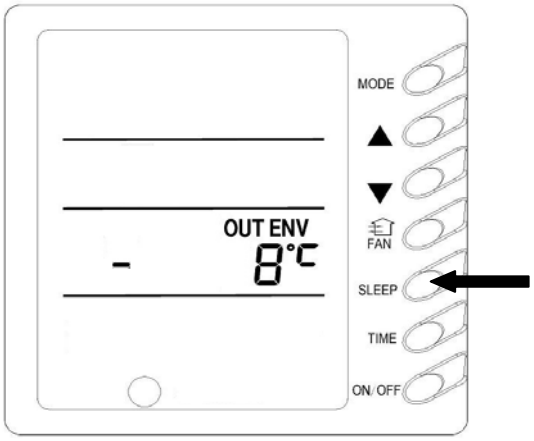


Fig. 10

10 seconds after display of outdoor environment temperature, the system will return back to the indoor environment temperature display interface.

Note: This function is not available if the unit is not connected with outdoor environment temp. sensor.

10) Memory Function Setting (Fig. 11)

Under stop status, you may hold MODE for 10 seconds to switch on or off the memory function. The 01

displayed in temperature setting area indicates that the unit will memorize the start / stop status after energization and the “02” indicates that the unit will not memorize the start / stop status after energization. Press ON/OFF to exit the setting. After calling out the memory function, if there is no operation within 20 seconds after the system has responded to the last press, the system will pop up this menu and display the normal stop interface. The setting of memory function is still stored.

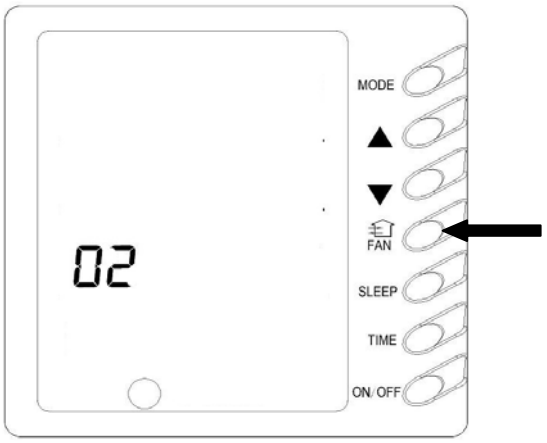


Fig. 11

11) Debugging Function (Fig. 12)

Under stop status, hold down FAN SPEED + SLEEP key for 10 seconds to call out the test menu. In this case, the DEBUG will be displayed. Use MODE key to adjust the setting and use “▲” or “▼” to set the value.

a）Setting of environment temp. sensor

Under debugging status, use MODE key to adjust the temperature setting area (on the left side of DEBUG) to “01”. The setting status is displayed in environment temperature area (on the right side of DEBUG). Use “▲” or “▼” to adjust. Three options are available:

① The indoor environment temperature is the environment temp. at air intake. (01 displayed in environment temp area).

② The indoor environment temperature is the temp. at display (02 displayed in environment temp area)

③ Air intake temp. sensor is selected for cooling, dehumidify and air outlet. And manual controller temp. sensor is selected for cooling and auto mode (03 displayed in environment temp area)

The factory default is □.

After calling out this interface, if there is no operation within 20 seconds after the system has responded to the last press, the system will pop up this menu and display the normal stop interface. The current setting data will still be stored.

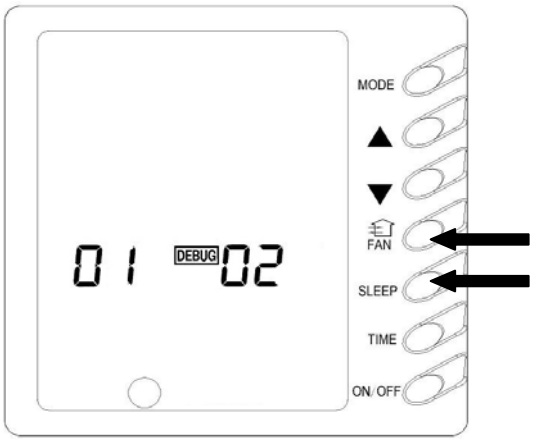


Fig. 12

12) View of System Internal Parameters (Fig. 13 and 14)

Under start status, hold down FAN SPEED + SLEEP key for 10 seconds to call out the test menu. In this case, the TEST will be displayed. Use "▲" or "▼" to adjust the display. The definition of 4 numerical tubes is: The first digit on the uppermost displays the system number 1 or 2, and the other three digits display the absolute value of exhaust temp. What is displayed in temperature setting area (on the left side of TEST) is the indoor tube temp. and what is displayed in the environment temp. area (on the right side of TEST) is the defrost sensor temp. If the temperature is less than 0, the □ will be displayed behind to identify the difference.

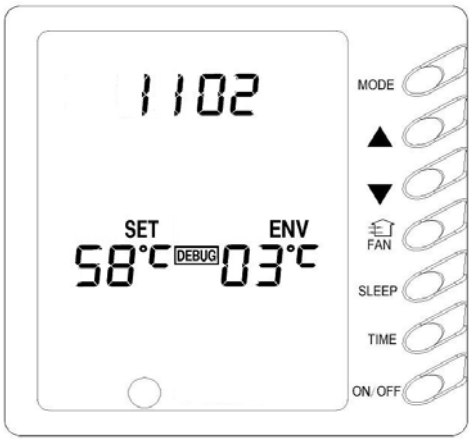


Fig. 13

Use "▲" or "▼" to adjust the display. When the first digit on the uppermost displays the character similar to "d" (Fig. 14), the 2nd numerical tube displays if the fresh air valve is open, the 3rd numerical tube displays the total number of fresh air valve and the 4th numerical tube displays the number of the air valves opened.

If not released after calling out the parameter test interface, the display will return to this interface after 30 seconds and show the normal startup interface.

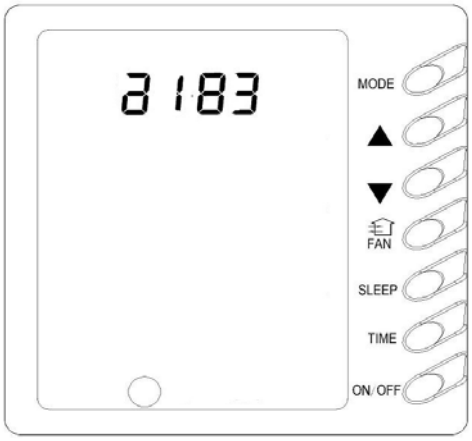


Fig. 14

13) Fault Display (Fig. 15)

When fault occurs during system operation, the ERROR will flash on the display and the error code will be displayed as well. For multiple faults, the error codes will be displayed in cycle. The 1st digit indicates the system number. The system number will not be displayed if there is only one system. The last two digits indicate the error code. For example, what is shown on right indicates the compressor low pressure protection in system 1.

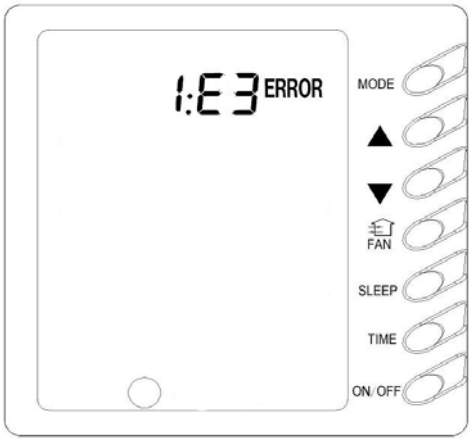


Fig.15

3.2 User Guideline for Remote Controller

Names and Functions of Remote Controller Keys

Precautions:

- This remote controller is a general-purpose remote controller, which can be used in various types (functions) air conditioner. The keys not applicable to this air conditioner are not explained here.
- Ensure there is no obstacle between the remote controller and the signal receiving window of the air conditioner.
- The distance able to receive the signal of the remote controller can be as far as 8 meters.
- Never drop or throw at will the remote controller.
- Never let any liquid enter the remote controller. Avoid direct sunshine over the remote controller. Do not place the remote controller in an extremely hot place.

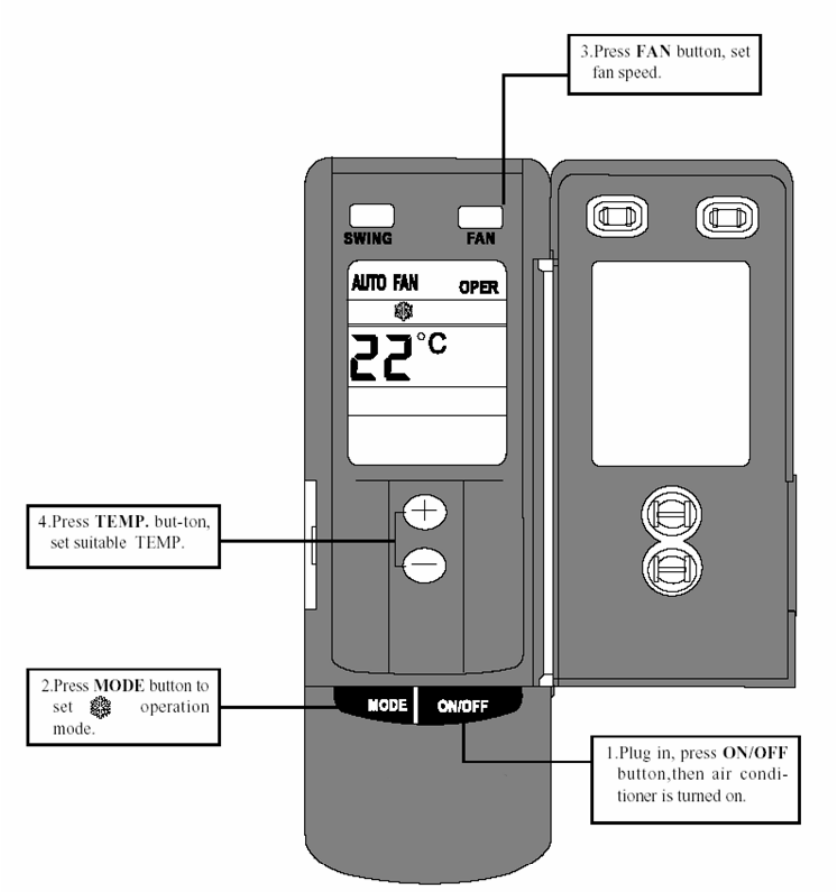


Fig. 14 Remote Controller

Cooling Mode Operation

Connect the unit to power supply. Press the “ON/OFF”key. Press the “MODE” key to select “Cooling” mode. Use the “Temperature” key to adjust the set temperature for the room. Refer to Figure 15.

Heating Mode Operation

Connect the unit to power supply. Press the “ON/OFF”key. Press the “MODE” key to select “Heating” mode. Use the “Temperature” key to adjust the set temperature for the room. Refer to Figure 16.

Under the heating mode, the unit has the functions of preventing cold air supply and supplying remaining heat. After the startup of the compressor, the indoor fan shall start operation when the

evaporator temperature is larger or equals 35□ or after the unit has be started for 45 seconds, so as to avoid supply of cold air shortly after the unit is started. After the stop of the compressor, the indoor fan shall stop operation after supplying air for 120 seconds.

DRY (Dehumidifying) Mode Operations

Connect the unit to power supply. Press the “ON/OFF” key. Press the “MODE” key to select “DRY (Dehumidifying)” mode. Use the “Temperature” key to adjust the set temperature for the room. Refer to Figure 17.

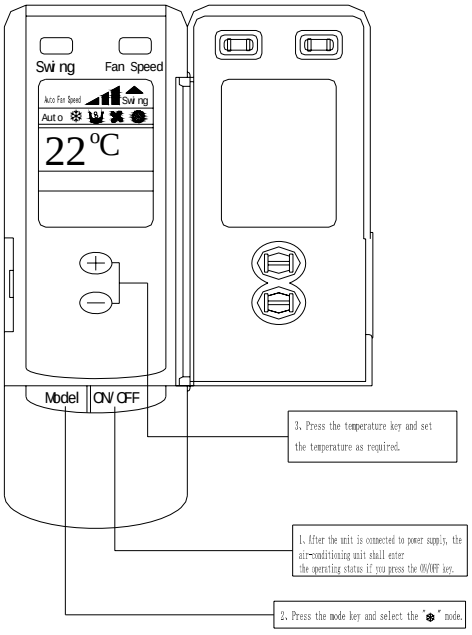

Swing
Fan Speed
Auto Fan Speed
Swing
Auto
22°C
Model
ON/OFF
3. Press the temperature key and set the temperature as required.
1. After the unit is connected to power supply, the air-conditioning unit shall enter the operating status if you press the ON/OFF key.
2. Press the mode key and select the "❄" mode.

Figure 15 Cooling Mode Operation

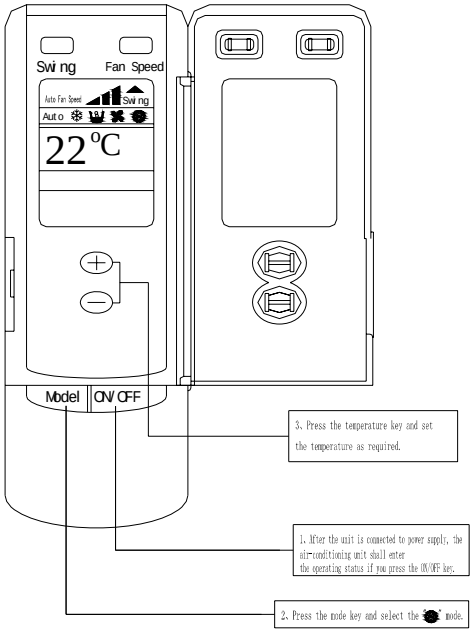

Swing
Fan Speed
Auto Fan Speed
Swing
Auto
22°C
Model
ON/OFF
3. Press the temperature key and set the temperature as required.
1. After the unit is connected to power supply, the air-conditioning unit shall enter the operating status if you press the ON/OFF key.
2. Press the mode key and select the "☀" mode.

Figure 16 Heating Mode Operation

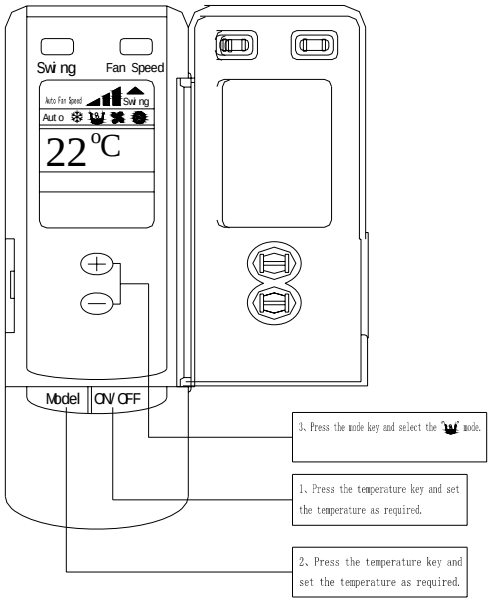


Figure 17 Dehumidifying Mode Operation

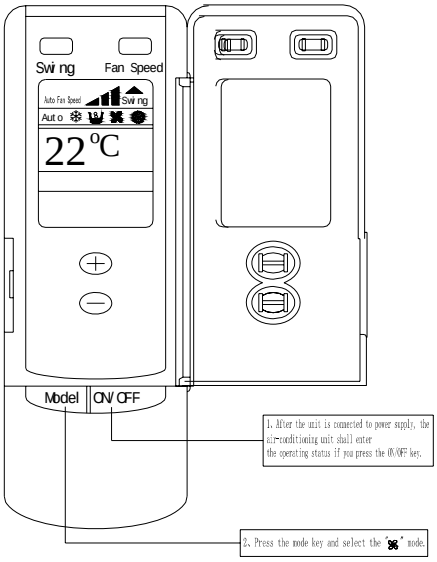
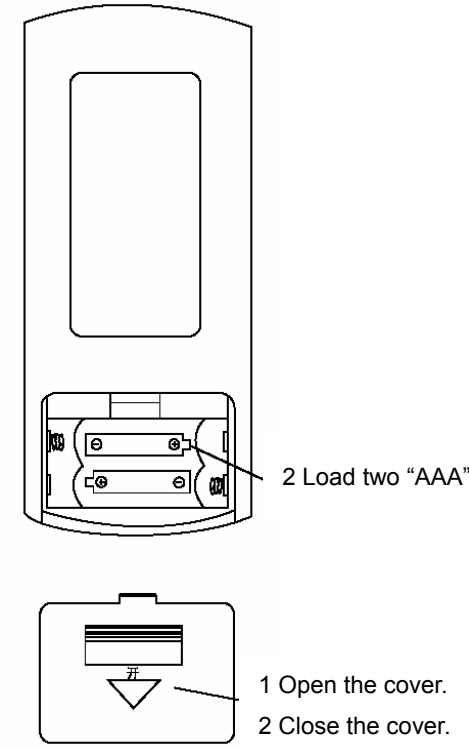

Swing
Fan Speed
Auto Fan Speed
Swing
Auto
22°C
Model
ON/OFF
1. After the unit is connected to power supply, the air-conditioning unit shall enter the operating status if you press the ON/OFF key.
2. Press the mode key and select the "✿" mode.

Figure 18 Fan Mode Operation

Fan Mode Operation

Connect the unit to power supply. Press the “ON/OFF”key. Press the “MODE” key to select “FAN” mode. The unit shall operate under “FAN” mode. Press the “FAN” key to select from high, medium and low speed. Refer to Figure 18.



- After batteries are installed, the display shall display icons and letter codes of all functions.
- The life of batteries is about 1 year.
- Do not mix new and old batteries or mix different types of batteries in usage.
- If the remote controller shall not be used for a long time, take out the batteries to avoid liquid leakage and any subsequent failure.

Figure 19 Replacing Batteries for Remote

Loading Batteries Into Remote Controller

Refer to Figure 19 for the methods and steps of installing batteries into the remote controller.

3.3 Week Timing Controller

1. Week Timing Controller (With Centralized Control Function)

Centralized Control and Week Timer Functions: The centralized controller and the weekly timer are integrated in the same wire controller. The system has both the centralized control and the week timing functions. Up to 16 sets of units can be controlled simultaneously by the centralized controller (weekly timer). The weekly timer has the function of invalidating the lower unit. The weekly timing function is able to realized four timing ON/OFF periods for any unit every day, so as to achieve fully automatic operation. No timing control can be set for holidays.

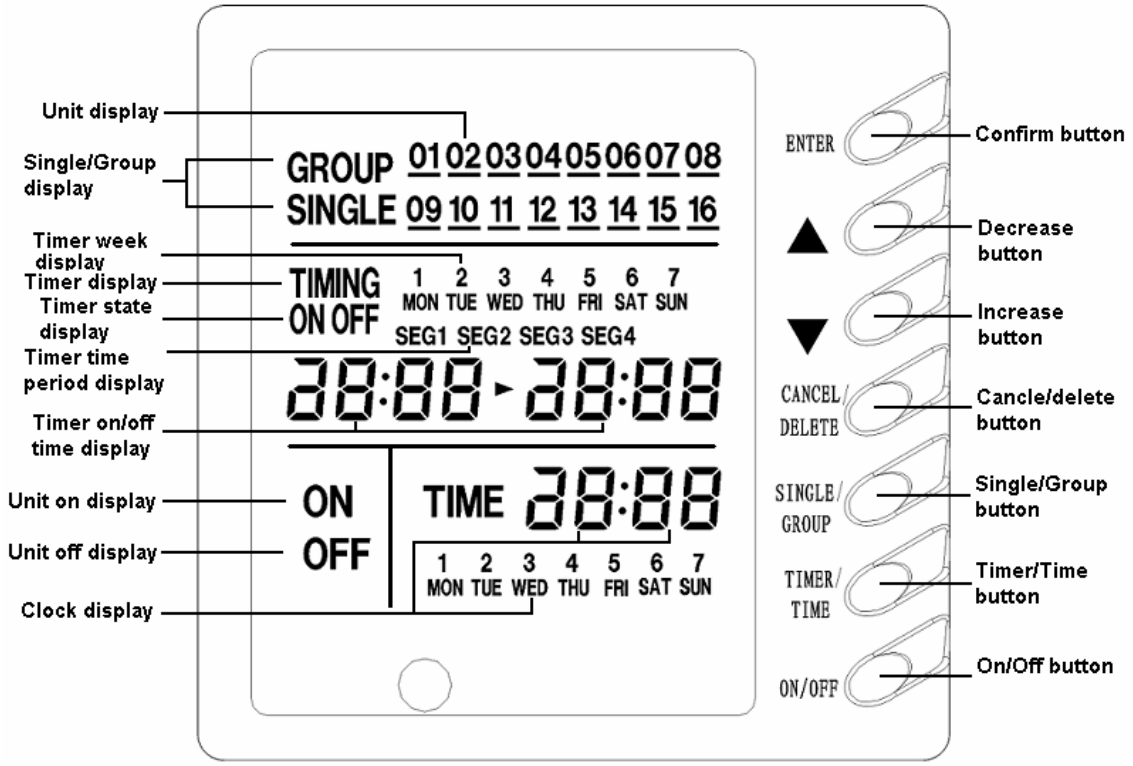
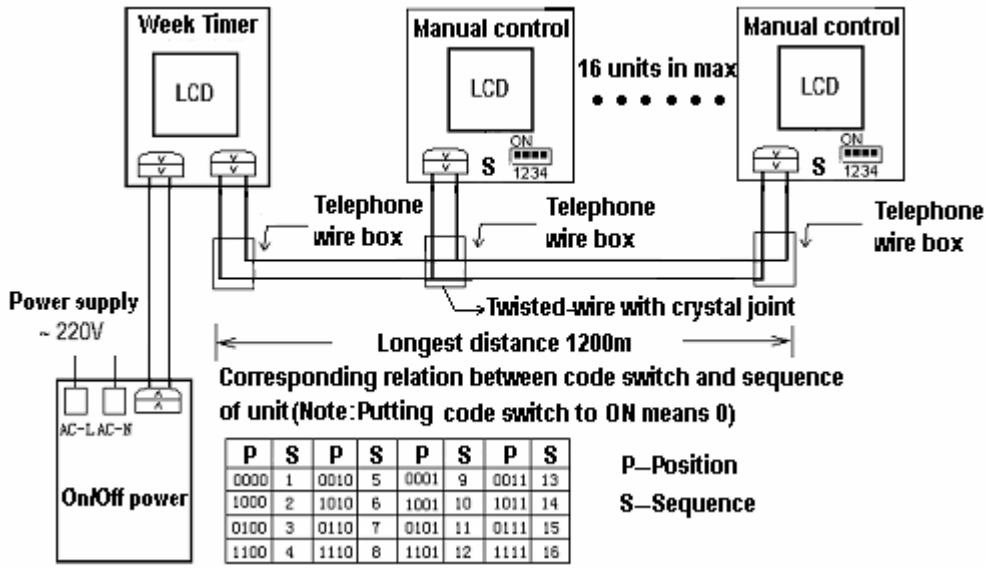


Fig.20

This WEEKLY TIMER adopts 485 mode to communicate with manual control of every duct type unit, and it can control up to 16 units. Adopting 2-core twisted-pair wire, the longest communication distance of this TIMER is 1200m. After connected to power, the WEEKLY TIMER can display all connected units (sequence of unit is determined by code switch of manual control of every duct type unit). On and off of every duct type unit can be done through the Timer On / Off of this WEEKLY TIMER, and the button shield operation of manual control can be done through shield setting on WEEKLY TIMER. Mode selection and temperature adjustment and other operations are done through the manual control at every unit.

1. Press ▲ or ▼ to select the unit that needed to be control. It is available to control several units by Group Control (1~16), or control single unit by Single Control.
1. When selected a certain or several units by Single Control or Group Control, Timer setting and On/off setting can be set. Timer setting can set 4 on/off times in a day in one week; and on/off setting can be done by pressing on/off button.
2. Connection between WEEKLY TIMER and manual control is shown as following:



P	S	P	S	P	S	P	S
0000	1	0010	5	0001	9	0011	13
1000	2	1010	6	1001	10	1011	14
0100	3	0110	7	0101	11	0111	15
1100	4	1110	8	1101	12	1111	16

Fig.21

Note:

1. For upper unit checks 16 lower units consecutively, there will be no more than 16 seconds delay when setting works till unit responds.
2. Please let us know your requirement before your placing the order, for this WEEKLY TIMER will only be prepared when customer orders (communication joint with WEEKLY TIMER on manual control had been prepared).

Chapter III Installation and Test (HV)

Chapter IV Repair and Maintenance

1. List of Error Codes

Table1 Definition of Error Codes on Display Panel

Error code	Malfunction
E0	Water pump malfunction
E1	High pressure protection of compressor
E2	Indoor anti-frozen protection
E3	Low pressure protection of compressor
E4	Air discharge high-temperature protection of compressor
E5	Overload protection of compressor or Inverter error
E6	Transmit malfunction
E8	Indoor fan protection
E9	Water flow protection
F0	Malfunction of indoor environment sensor at air return vent
F1	Evaporator sensor malfunction
F2	Condenser sensor malfunction
F3	Outdoor environment sensor malfunction
F4	Malfunction of air discharge sensor
F5	Malfunction of environment sensor on displayer
EH	Auxiliary electric heater malfunction

Table 2 LED Indication Codes of Outdoor Main Control Board

Item	LED Indication of Outdoor Main Control Board						Display Indication
	LED6	LED5	LED4	LED3	LED2	LED1	
DC bus overvoltage protection	ON	BLINK	ON	ON	ON	ON	E5
Radiator fin overheat protection	ON	BLINK	ON	ON	ON	BLINK	E5
Current sensor fault	ON	BLINK	ON	ON	BLINK	ON	E5
Radiator sensor fault	ON	BLINK	ON	BLINK	ON	ON	E5
Compressor current protection	ON	BLINK	ON	BLINK	ON	BLINK	E5
DC bus undervoltage protection	ON	BLINK	ON	BLINK	BLINK	ON	E5
Compressor startup failure	ON	BLINK	OFF	ON	ON	ON	E5
PFC abnormal	ON	BLINK	OFF	ON	ON	OFF	E5
Compressor clogged	ON	BLINK	OFF	ON	ON	BLINK	E5
IPM module resetting	ON	BLINK	OFF	ON	OFF	ON	E5
Loss-of-synchronization of compressor motor	ON	BLINK	OFF	ON	OFF	OFF	E5
Inverter phase-failure or loss-of-regulation	ON	BLINK	OFF	ON	OFF	BLINK	E5
Communication fault from inverter to main controller	ON	ON	OFF	OFF	OFF	BLINK	E5
IPM module protection	ON	BLINK	BLINK	ON	ON	ON	E5
Compressor overspeed	ON	BLINK	BLINK	ON	ON	OFF	E5
Sensor connection protection	ON	BLINK	BLINK	ON	ON	BLINK	E5
Temperature shift protection	ON	BLINK	BLINK	ON	OFF	ON	E5
AC contactor protection	ON	BLINK	BLINK	ON	OFF	OFF	E5
AC current protection (input side)	ON	BLINK	ON	BLINK	ON	OFF	E5
Inverter ambient sensor fault	ON	BLINK	ON	BLINK	OFF	ON	E5
High pressure protection	ON	BLINK	OFF	OFF	OFF	BLINK	E1
Low pressure protection	ON	BLINK	OFF	OFF	BLINK	OFF	E3
Exhaust protection	ON	BLINK	OFF	OFF	BLINK	BLINK	E4
Overload protection of compressor	ON	BLINK	OFF	BLINK	OFF	OFF	E5
Communication fault (indoor / outdoor unit, manual controller)	ON	BLINK	OFF	BLINK	BLINK	OFF	E6
Outdoor ambient sensor fault	ON	BLINK	BLINK	OFF	OFF	OFF	F3
Outdoor coil middle sensor fault	ON	BLINK	BLINK	OFF	BLINK	OFF	F2
Inverter exhaust temp. fault	ON	BLINK	BLINK	BLINK	OFF	BLINK	F4
Defrost (not fault)	ON	BLINK	OFF	BLINK	BLINK	BLINK	Defrost
Oil return (not fault)	ON	BLINK	BLINK	BLINK	ON	BLINK	No display
Indoor and outdoor unit incompatible	ON	BLINK	OFF	BLINK	ON	BLINK	No display

Note: No indicator LED6 for ASGE-18AI.

2 . Troubleshooting for Typical Faults

Troubleshooting sequence: Firstly, view the error description according to the error code on the display. If E5 is displayed, it is needed to open the electric box of outdoor unit and record the LED indication on the outdoor main control board. Then, find out the fault by referring to the LED Indication Codes of Outdoor Main Control Board. After confirming the fault, find the cause according to the instructions below:

A. Communication Fault (E6)

Check the communication wire between indoor unit and outdoor unit to ensure if the wire is open circuited or short circuited and if the connector is loose.

B. Temperature Sensor Fault (F0, F1, F2, F3, F4 and F5)

Check if the wire from temperature sensor to mainboard is loose. Insert tightly if loose. If the temperature sensor does not loosen from the mainboard, pull off the temperature sensor and use multimeter to measure the resistance on the two ends of temperature sensor. If the resistance is infinite high or very low (close to “0”), we can judge that the sensor is damaged and shall be replaced. For the position of each temperature sensor on mainboard, please see the PBC interface diagram attached.

C. High Pressure Protection

When high pressure protection is detected for 3 seconds successively, the unit will shut down all the loads (except the 4-way valve of heating) and shield all the keys and remote signals except the On/Off, in which case the run indicator will blink (or display fault code E1) and the buzzer will alarm. The fault cannot be restored automatically. You shall need to press ON/Off to stop the unit, then turn off the indicator (or clear E1 display) before pressing ON/OFF. The unit will be restarted if the high pressure protection disappears. Otherwise, the run indicator will blink (or display fault code E1) and the buzzer will alarm.

D. Low Pressure Protection

It will be deemed low-pressure protection as long as it is detected for 30 seconds successively that the low-pressure switch is cut off, in which case the indicator will blink (or display E3), all the loads will be stopped (except the 4-way valve of heating). If the fault is eliminated, the compressor will be restarted after 3 minutes. If three low-pressure faults of compressor are detected successively in 30 minutes from the first detection to the occurrence of fault, the indicator will blink (or display E3) and the buzzer will alarm. The unit cannot be restored automatically. You shall need to press ON/Off to stop the unit, then turn off the indicator before pressing ON/OFF. The unit will be restarted if the high pressure protection disappears. Otherwise, the run indicator will blink (or display fault code E3) and the buzzer will alarm.

E. Exhaust Overtemperature Protection

After the compressor is started, it is detected for 30 seconds successively that the exhaust temperature is higher than 115°C; E4 is displayed; and all the loads will be stopped (except the 4-way valve of heating). After the compressor is stopped for 3 minutes, the fault code will be cleared and the complete unit will resume to operation if the exhaust temperature is lower than 90°C. If such protection occurs three time successively within 30 minutes, the complete unit cannot resume to operation, in which case E4 will be displayed and the buzzer will alarm. You shall need to press ON/Off to stop the unit and then press ON/OFF again. If the exhaust temperature is lower than 90°C, the unit will run under preset mode. Communication Fault between Main Controller and Inverter

F. E5 Protection (Overcurrent Protection or Inverter Fault)

Firstly, please check if the overload switch of the compressor is open. If it is not open or the compressor has no overload switch, please refer to the troubleshooting process for inverter.

3. Inverter Troubleshooting

3.1 Typical Troubleshooting for Inverter ASGE-18AI

3.1.1 Troubleshooting and Treatment of Inverter Faults

(1) DC Overvoltage: If it is detected that the DV voltage is higher than 420V upon energization, this fault will be alarmed. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.

(2) DC Undervoltage: If it is detected that the DV voltage is lower than 200V upon energization, this fault will be alarmed. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.

(3) Inverter Module Resetting: Initialize the inverter program. This fault is alarmed upon energization after each de-energization or upon resetting of inverter chip caused by some interference. 5s will be displayed after occurrence of this fault. Note: It is normal that this alarm will occur upon energization after de-energization.

(4) Inverter IPM Abnormal: This fault is alarmed when it is detected that IMP module or PFC module is abnormal. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.

(5) Radiator Fin Overheat Protection: This fault is alarmed when it is detected in 1s successively that the radiator fin temperature is higher than 105□. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.

(6) Compressor Overcurrent Protection: This fault is alarmed when it is detected in 1ms successively that the transient current of compressor is higher than 18A. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.

(7) Compressor in Loss of Synchronization: This fault is alarmed when it is detected in 2s successively that the negative potential of the compressor in run period is lower than 20V. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.

(8) Compressor Over-frequency Protection: This fault is alarmed when it is detected in 2s successively that the working frequency of compressor is higher than 200HZ or the difference between working frequency and preset frequency is over 40Hz. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.

F. E5 Protection (Overcurrent Protection or Inverter Fault)

Firstly, please check if the overload switch of the compressor is open. If it is not open or the compressor has no overload switch, please refer to the troubleshooting process for inverter.

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(3) Inverter Module Resetting: Initialize the inverter program. This fault is alarmed upon energization after each de-energization or upon resetting of inverter chip caused by some interference. 5s will be displayed after occurrence of this fault. Note: It is normal that this alarm will occur upon energization after de-energization.

(4) Inverter IPM Abnormal: This fault is alarmed when it is detected that IMP module or PFC module is abnormal. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.

(5) Radiator Fin Overheat Protection: This fault is alarmed when it is detected in 1s successively that the radiator fin temperature is higher than 105□. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.

(6) Compressor Overcurrent Protection: This fault is alarmed when it is detected in 1ms successively that the transient current of compressor is higher than 18A. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.

(7) Compressor in Loss of Synchronization: This fault is alarmed when it is detected in 2s successively that the negative potential of the compressor in run period is lower than 20V. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.

(8) Compressor Over-frequency Protection: This fault is alarmed when it is detected in 2s successively that the working frequency of compressor is higher than 200HZ or the difference between working frequency and preset frequency is over 40Hz. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.

2 . Troubleshooting for Typical Faults

Troubleshooting sequence: Firstly, view the error description according to the error code on the display. If E5 is displayed, it is needed to open the electric box of outdoor unit and record the LED indication on the outdoor main control board. Then, find out the fault by referring to the LED Indication Codes of Outdoor Main Control Board. After confirming the fault, find the cause according to the instructions below:

A. Communication Fault (E6)

Check the communication wire between indoor unit and outdoor unit to ensure if the wire is open circuited or short circuited and if the connector is loose.

B. Temperature Sensor Fault (F0, F1, F2, F3, F4 and F5)

Check if the wire from temperature sensor to mainboard is loose. Insert tightly if loose. If the temperature sensor does not loosen from the mainboard, pull off the temperature sensor and use multimeter to measure the resistance on the two ends of temperature sensor. If the resistance is infinite high or very low (close to “0”), we can judge that the sensor is damaged and shall be replaced. For the position of each temperature sensor on mainboard, please see the PBC interface diagram attached.

C. High Pressure Protection

When high pressure protection is detected for 3 seconds successively, the unit will shut down all the loads (except the 4-way valve of heating) and shield all the keys and remote signals except the On/Off, in which case the run indicator will blink (or display fault code E1) and the buzzer will alarm. The fault cannot be restored automatically. You shall need to press ON/Off to stop the unit, then turn off the indicator (or clear E1 display) before pressing ON/OFF. The unit will be restarted if the high pressure protection disappears. Otherwise, the run indicator will blink (or display fault code E1) and the buzzer will alarm.

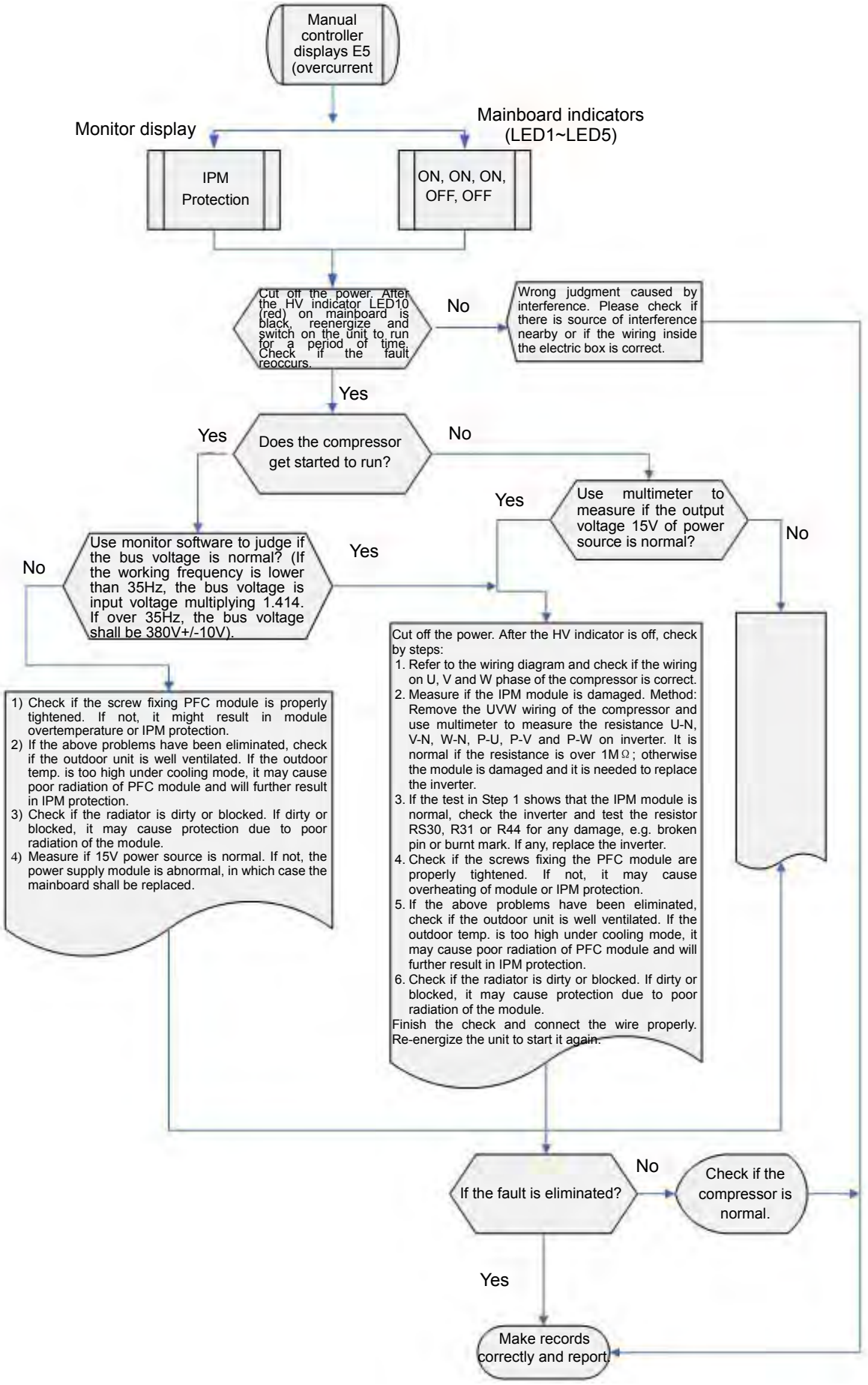
D. Low Pressure Protection

It will be deemed low-pressure protection as long as it is detected for 30 seconds successively that the low-pressure switch is cut off, in which case the indicator will blink (or display E3), all the loads will be stopped (except the 4-way valve of heating). If the fault is eliminated, the compressor will be restarted after 3 minutes. If three low-pressure faults of compressor are detected successively in 30 minutes from the first detection to the occurrence of fault, the indicator will blink (or display E3) and the buzzer will alarm. The unit cannot be restored automatically. You shall need to press ON/Off to stop the unit, then turn off the indicator before pressing ON/OFF. The unit will be restarted if the high pressure protection disappears. Otherwise, the run indicator will blink (or display fault code E3) and the buzzer will alarm.

E. Exhaust Overtemperature Protection

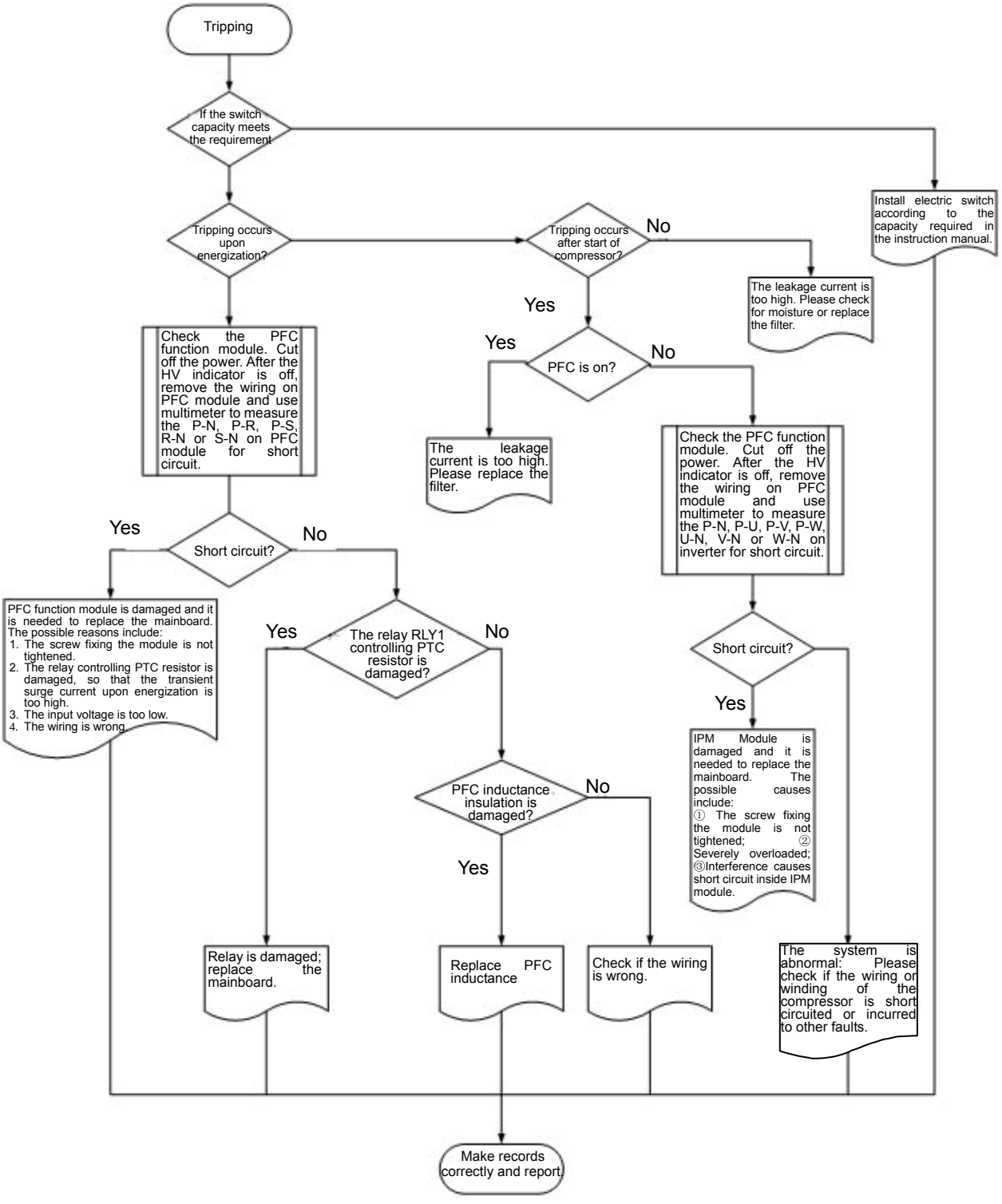
After the compressor is started, it is detected for 30 seconds successively that the exhaust temperature is higher than 115°C; E4 is displayed; and all the loads will be stopped (except the 4-way valve of heating). After the compressor is stopped for 3 minutes, the fault code will be cleared and the complete unit will resume to operation if the exhaust temperature is lower than 90°C. If such protection occurs three time successively within 30 minutes, the complete unit cannot resume to operation, in which case E4 will be displayed and the buzzer will alarm. You shall need to press ON/Off to stop the unit and then press ON/OFF again. If the exhaust temperature is lower than 90°C, the unit will run under preset mode. Communication Fault between Main Controller and Inverter

Check if the communication wire between main control board and inverter is loose or broken.


Manual controller displays E5 (overcurrent
Monitor display
Mainboard indicators (LED1~LED5)
IPM Protection
ON, ON, ON, OFF, OFF
Cut off the power. After the HV indicator LED10 (red) on mainboard is black, reenergize and switch on the unit to run for a period of time. Check if the fault reoccurs.
No
Wrong judgment caused by interference. Please check if there is source of interference nearby or if the wiring inside the electric box is correct.
Yes
Yes
Does the compressor get started to run?
No
Yes
Use multimeter to measure if the output voltage 15V of power source is normal?
No
No
Use monitor software to judge if the bus voltage is normal? (If the working frequency is lower than 35Hz, the bus voltage is input voltage multiplying 1.414. If over 35Hz, the bus voltage shall be 380V+/-10V).
Yes
1) Check if the screw fixing PFC module is properly tightened. If not, it might result in module overtemperature or IPM protection.
2) If the above problems have been eliminated, check if the outdoor unit is well ventilated. If the outdoor temp. is too high under cooling mode, it may cause poor radiation of PFC module and will further result in IPM protection.
3) Check if the radiator is dirty or blocked. If dirty or blocked, it may cause protection due to poor radiation of the module.
4) Measure if 15V power source is normal. If not, the power supply module is abnormal, in which case the mainboard shall be replaced.
Cut off the power. After the HV indicator is off, check by steps:
1. Refer to the wiring diagram and check if the wiring on U, V and W phase of the compressor is correct.
2. Measure if the IPM module is damaged. Method: Remove the UVW wiring of the compressor and use multimeter to measure the resistance U-N, V-N, W-N, P-U, P-V and P-W on inverter. It is normal if the resistance is over 1MΩ; otherwise the module is damaged and it is needed to replace the inverter.
3. If the test in Step 1 shows that the IPM module is normal, check the inverter and test the resistor RS30, R31 or R44 for any damage, e.g. broken pin or burnt mark. If any, replace the inverter.
4. Check if the screws fixing the PFC module are properly tightened. If not, it may cause overheating of module or IPM protection.
5. If the above problems have been eliminated, check if the outdoor unit is well ventilated. If the outdoor temp. is too high under cooling mode, it may cause poor radiation of PFC module and will further result in IPM protection.
6. Check if the radiator is dirty or blocked. If dirty or blocked, it may cause protection due to poor radiation of the module.
Finish the check and connect the wire properly. Re-energize the unit to start it again.
If the fault is eliminated?
No
Check if the compressor is normal.
Yes
Make records correctly and report.

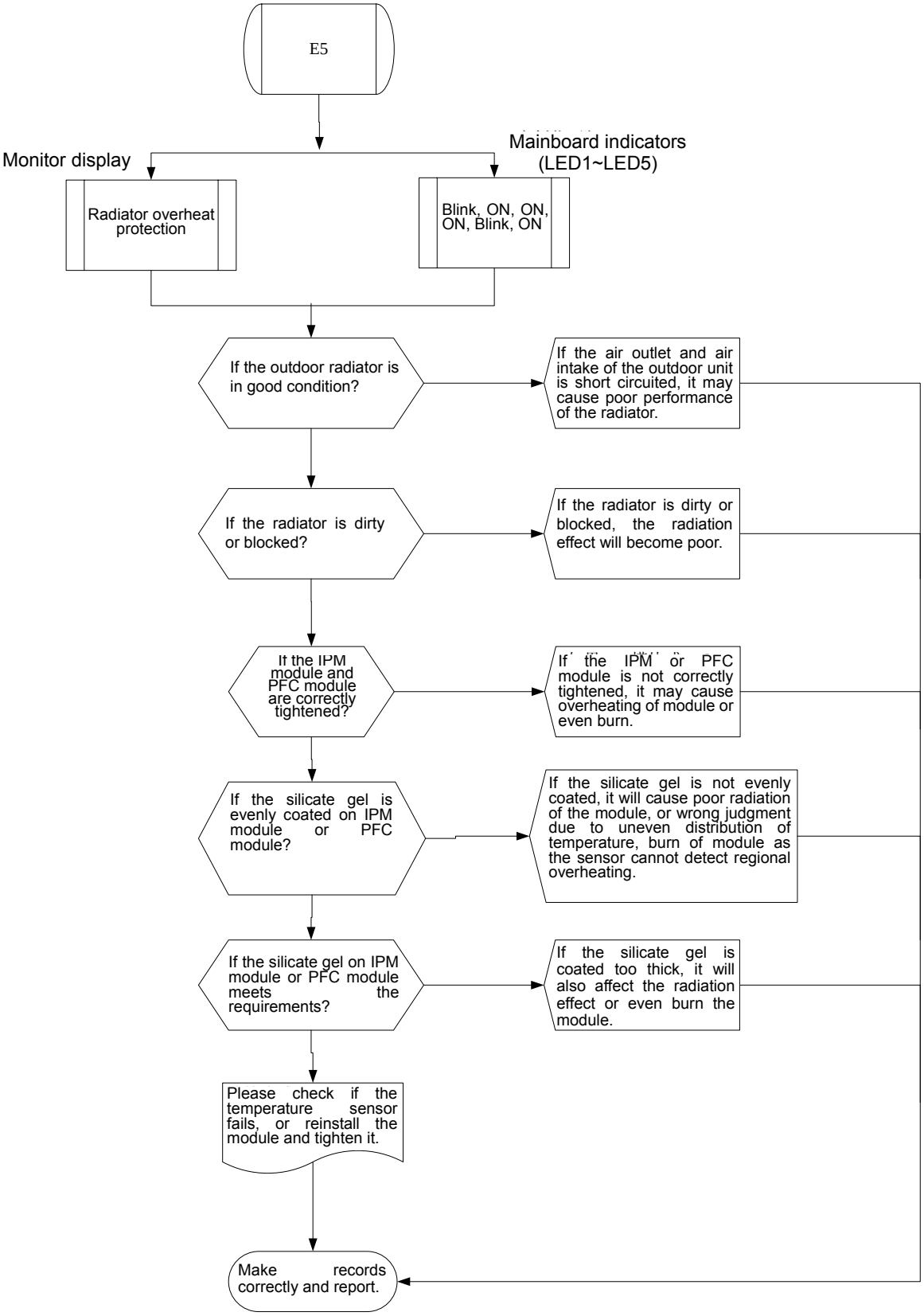
3.1.2.2 Troubleshooting Process for IPM Protection

3.1.2.3 Troubleshooting Process for Tripping


Tripping
If the switch capacity meets the requirement
Install electric switch according to the capacity required in the instruction manual.
Tripping occurs upon energization?
Tripping occurs after start of compressor?
No
The leakage current is too high. Please check for moisture or replace the filter.
Yes
Yes
PFC is on?
No
Check the PFC function module. Cut off the power. After the HV indicator is off, remove the wiring on PFC module and use multimeter to measure the P-N, P-R, P-S, R-N or S-N on PFC module for short circuit.
The leakage current is too high. Please replace the filter.
Check the PFC function module. Cut off the power. After the HV indicator is off, remove the wiring on PFC module and use multimeter to measure the P-N, P-U, P-V, P-W, U-N, V-N or W-N on inverter for short circuit.
Yes
Short circuit?
No
PFC function module is damaged and it is needed to replace the mainboard. The possible reasons include:
1. The screw fixing the module is not tightened.
2. The relay controlling PTC resistor is damaged, so that the transient surge current upon energization is too high.
3. The input voltage is too low.
4. The wiring is wrong.
Yes
The relay RLY1 controlling PTC resistor is damaged?
No
Short circuit?
Yes
IPM Module is damaged and it is needed to replace the mainboard. The possible causes include:
① The screw fixing the module is not tightened; ② Severely overloaded; ③Interference causes short circuit inside IPM module.
PFC inductance insulation is damaged?
No
Yes
Relay is damaged; replace the mainboard.
Replace PFC inductance
Check if the wiring is wrong.
The system is abnormal: Please check if the wiring or winding of the compressor is short circuited or incurred to other faults.
Make records correctly and report.

3.1.2.3 Troubleshooting Process for Tripping Protection

3.1.2.4 Troubleshooting Process for Radiator Overheating Protection


E5
Monitor display
Mainboard indicators (LED1~LED5)
Radiator overheat protection
Blink, ON, ON, ON, Blink, ON
If the outdoor radiator is in good condition?
If the air outlet and air intake of the outdoor unit is short circuited, it may cause poor performance of the radiator.
If the radiator is dirty or blocked?
If the radiator is dirty or blocked, the radiation effect will become poor.
If the IPM module and PFC module are correctly tightened?
If the IPM or PFC module is not correctly tightened, it may cause overheating of module or even burn.
If the silicate gel is evenly coated on IPM module or PFC module?
If the silicate gel is not evenly coated, it will cause poor radiation of the module, or wrong judgment due to uneven distribution of temperature, burn of module as the sensor cannot detect regional overheating.
If the silicate gel on IPM module or PFC module meets the requirements?
If the silicate gel is coated too thick, it will also affect the radiation effect or even burn the module.
Please check if the temperature sensor fails, or reinstall the module and tighten it.
Make records correctly and report.

3.1.2.4 Troubleshooting Process for Tripping Protection

3.2 Typical Troubleshooting for Inverter ASGE-24AI

3.2.1 Troubleshooting and Treatment of Inverter Faults

1) DC Overvoltage: If it is detected that the DV voltage is higher than 420V upon energization, this fault will be alarmed. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
2) DC Undervoltage: If it is detected that the DV voltage is lower than 200V upon energization, this fault will be alarmed. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
3) PFC Abnormal: This fault is alarmed when it is detected that PFC module is abnormal 10 seconds after start of PFC. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
4) Inverter Module Resetting: The protection when it is detected of the change of compressor parameters in inverter chip. This protection can be restored automatically.
5) Inverter IPM Protection: The protection when it is detected that the IPM module is abnormal. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
6) Startup Failure: The protection that the compressor cannot be started normally. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
7) Radiator Sensor Abnormal: The protection when it is detected that the sensor on top of IPM sensor is open circuit or short circuit. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
8) Radiator Fin Overheat Protection: The protection when it is detected that the internal temperature of IPM is higher than 105□. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
9) Communication Fault: The adapting chip cannot communicate normally with inverter chip for 15s successively or cannot communicate normally with the main controller for 30 seconds successively. This fault can be restored automatically.

3.2.2 Troubleshooting Process for Typical Inverter Faults

3.3 Typical Troubleshooting for Inverter **ASGE-36AI,**

3.3.1 Troubleshooting and Treatment of Inverter Faults

1) DC Overvoltage: If it is detected that the DV voltage is higher than 420V upon energization, this fault will be alarmed. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
2) DC Undervoltage: If it is detected that the DV voltage is lower than 200V upon energization, this fault will be alarmed. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
3) PFC Abnormal: This fault is alarmed when it is detected that PFC module is abnormal 10 seconds after start of PFC. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
4) Inverter Module Resetting: The protection when it is detected of the change of compressor parameters in inverter chip. This protection can be restored automatically.
5) Inverter IPM Protection: The protection when it is detected that the IPM module is abnormal. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
6) Inverter IPM Overheat Protection: The protection when it is detected that the internal temperature of IPM is higher than 110□. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
7) Compressor Overcurrent Protection: This fault is alarmed when it is detected in 1ms successively that the transient current of compressor is higher than 45A. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
8) Compressor in Loss of Synchronization: The protection when it is detected in 2s successively that the negative potential of the compressor in run period is lower than 20V. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
9) Compressor in Loss of Phase: It is detected that the difference between estimated revolution and preset revolution is over 199Hz.
10) Communication Fault between Inverter and Main Controller: It is detected in 60s successively that the inverter cannot communicate with the main controller normally. This fault can be restored automatically.
11) Current Detection Circuit Fault: This fault is alarmed when it is detected that the average bias

voltage is higher than 12.5% of 1.65V. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.

3.3.2 Troubleshooting Process for Typical Inverter Faults

3.3.2.1 PFC Board Abnormal

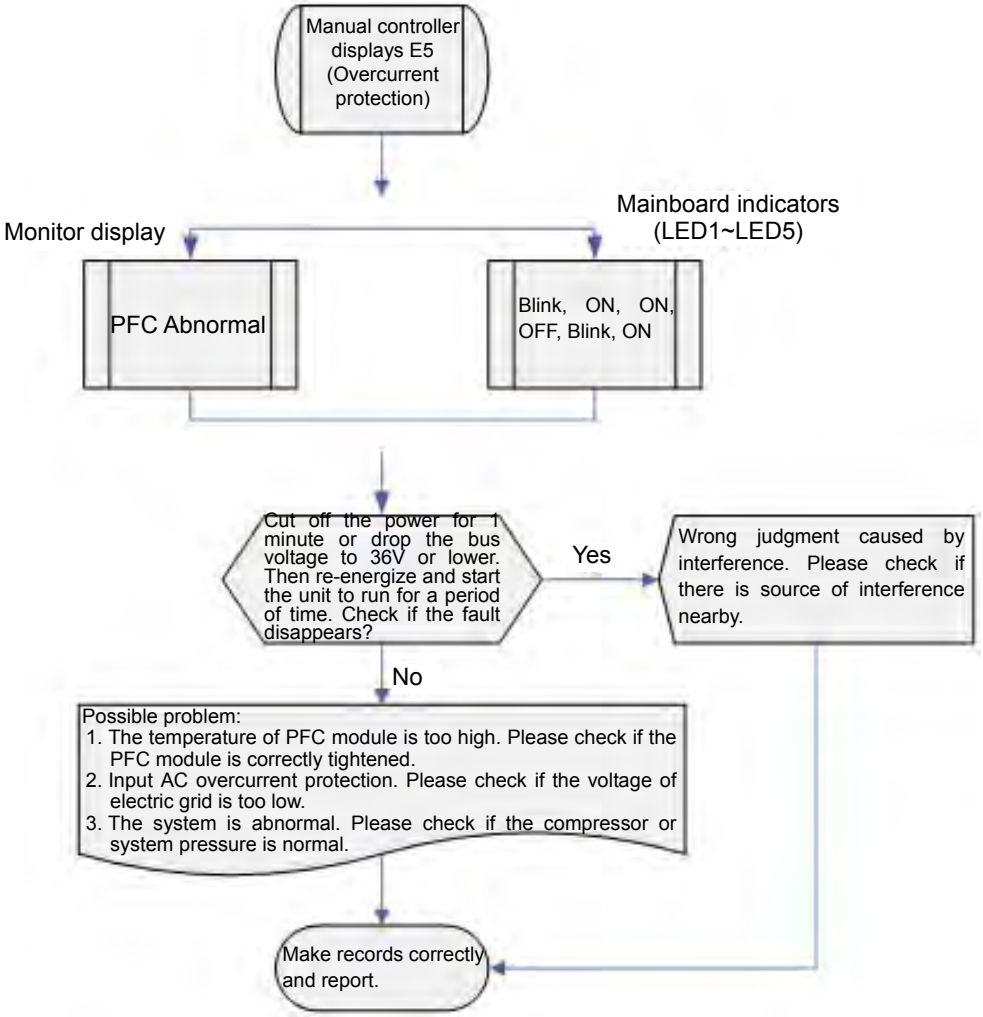

Manual controller displays E5 (Overcurrent protection)
Monitor display
Mainboard indicators (LED1~LED5)
PFC Abnormal
Blink, ON, ON, OFF, Blink, ON
Cut off the power for 1 minute or drop the bus voltage to 36V or lower. Then re-energize and start the unit to run for a period of time. Check if the fault disappears?
Yes
Wrong judgment caused by interference. Please check if there is source of interference nearby.
No
Possible problem:
1. The temperature of PFC module is too high. Please check if the PFC module is correctly tightened.
2. Input AC overcurrent protection. Please check if the voltage of electric grid is too low.
3. The system is abnormal. Please check if the compressor or system pressure is normal.
Make records correctly and report.

Fig.3.3.2.1 Troubleshooting Process for PFC Board Abnormality

3.3.2.2 Inverter IPM Protection

The possible reasons causing inverter IPM protection include:

- The screw fixing the IPM is not correctly tightened.
- The radiation of IPM module is poor.
- The PFC module is abnormal.
- The resistor RS-RS6 on inverter board is damaged.
- Interference
- The IPM module is damaged.
- The +15V voltage of power board is abnormal.
- Cable connection to PFC.
- The compressor is abnormal.

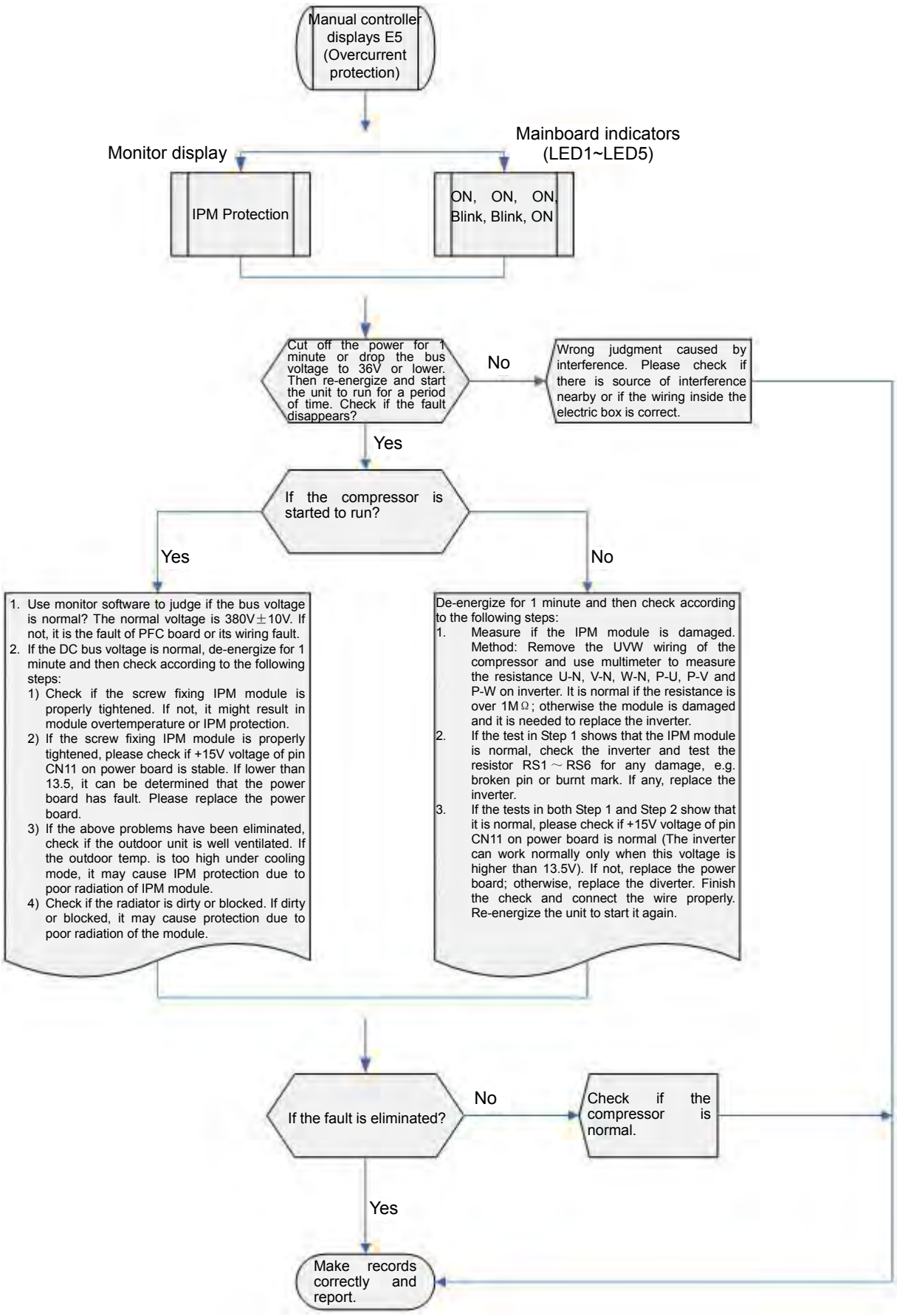

Manual controller displays E5 (Overcurrent protection)
Monitor display
Mainboard indicators (LED1~LED5)
IPM Protection
ON, ON, ON, Blink, Blink, ON
Cut off the power for 1 minute or drop the bus voltage to 36V or lower. Then re-energize and start the unit to run for a period of time. Check if the fault disappears?
No
Wrong judgment caused by interference. Please check if there is source of interference nearby or if the wiring inside the electric box is correct.
Yes
If the compressor is started to run?
Yes
No
1. Use monitor software to judge if the bus voltage is normal? The normal voltage is 380V±10V. If not, it is the fault of PFC board or its wiring fault.
2. If the DC bus voltage is normal, de-energize for 1 minute and then check according to the following steps:
1) Check if the screw fixing IPM module is properly tightened. If not, it might result in module overtemperature or IPM protection.
2) If the screw fixing IPM module is properly tightened, please check if +15V voltage of pin CN11 on power board is stable. If lower than 13.5, it can be determined that the power board has fault. Please replace the power board.
3) If the above problems have been eliminated, check if the outdoor unit is well ventilated. If the outdoor temp. is too high under cooling mode, it may cause IPM protection due to poor radiation of IPM module.
4) Check if the radiator is dirty or blocked. If dirty or blocked, it may cause protection due to poor radiation of the module.
De-energize for 1 minute and then check according to the following steps:
1. Measure if the IPM module is damaged. Method: Remove the UVW wiring of the compressor and use multimeter to measure the resistance U-N, V-N, W-N, P-U, P-V and P-W on inverter. It is normal if the resistance is over 1MΩ; otherwise the module is damaged and it is needed to replace the inverter.
2. If the test in Step 1 shows that the IPM module is normal, check the inverter and test the resistor RS1～RS6 for any damage, e.g. broken pin or burnt mark. If any, replace the inverter.
3. If the tests in both Step 1 and Step 2 show that it is normal, please check if +15V voltage of pin CN11 on power board is normal (The inverter can work normally only when this voltage is higher than 13.5V). If not, replace the power board; otherwise, replace the diverter. Finish the check and connect the wire properly. Re-energize the unit to start it again.
If the fault is eliminated?
No
Check if the compressor is normal.
Yes
Make records correctly and report.

Fig. 3.3.2.2 Troubleshooting Process for Inverter IPM Protection

3.3.2.3Tripping

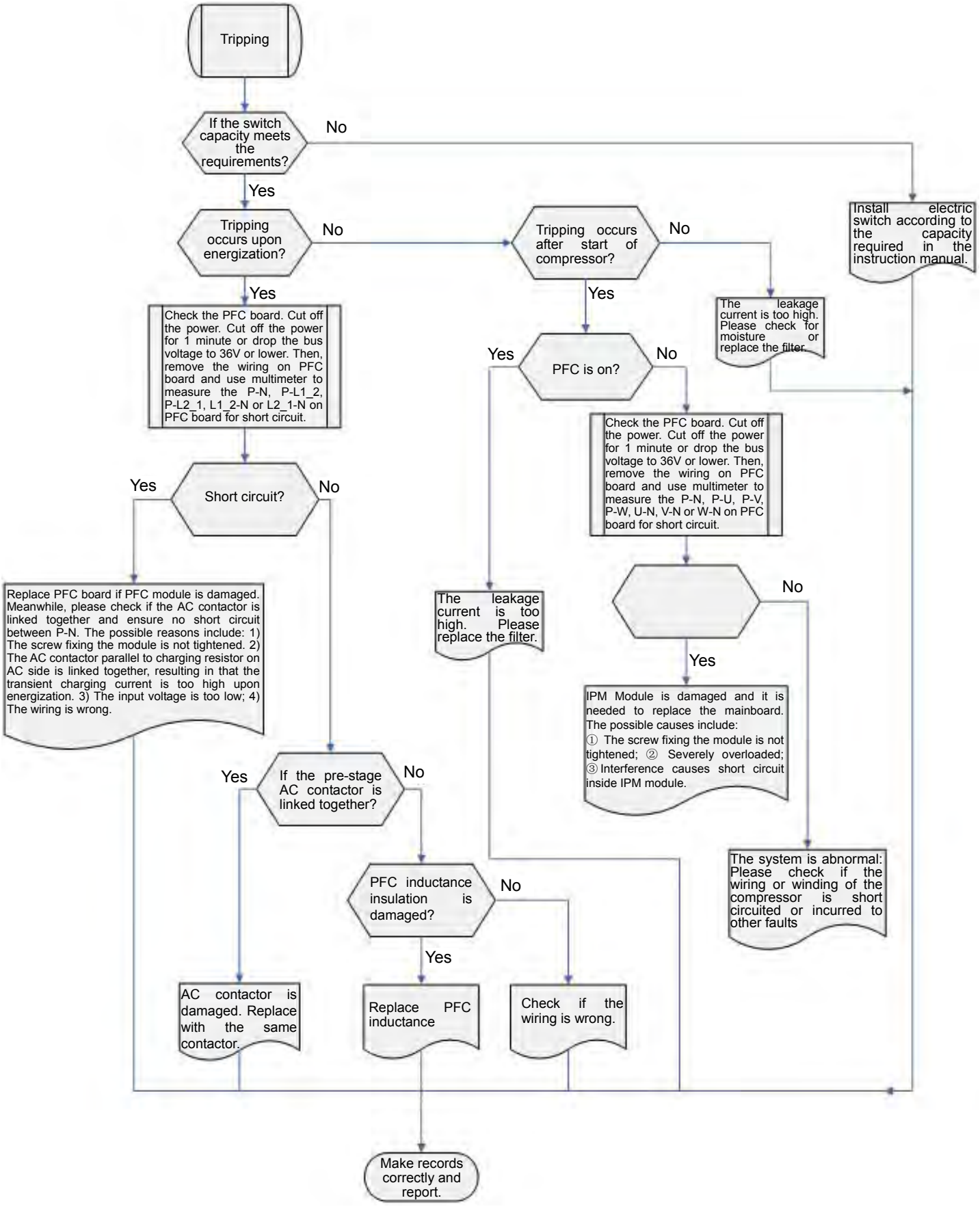

Tripping
If the switch capacity meets the requirements?
No
Yes
Install electric switch according to the capacity required in the instruction manual.
Tripping occurs upon energization?
No
Tripping occurs after start of compressor?
No
Yes
Yes
Check the PFC board. Cut off the power. Cut off the power for 1 minute or drop the bus voltage to 36V or lower. Then, remove the wiring on PFC board and use multimeter to measure the P-N, P-L1_2, P-L2_1, L1_2-N or L2_1-N on PFC board for short circuit.
The leakage current is too high. Please check for moisture or replace the filter.
Yes
PFC is on?
No
Check the PFC board. Cut off the power. Cut off the power for 1 minute or drop the bus voltage to 36V or lower. Then, remove the wiring on PFC board and use multimeter to measure the P-N, P-U, P-V, P-W, U-N, V-N or W-N on PFC board for short circuit.
Yes
Short circuit?
No
The leakage current is too high. Please replace the filter.
No
Yes
Replace PFC board if PFC module is damaged. Meanwhile, please check if the AC contactor is linked together and ensure no short circuit between P-N. The possible reasons include: 1) The screw fixing the module is not tightened. 2) The AC contactor parallel to charging resistor on AC side is linked together, resulting in that the transient charging current is too high upon energization. 3) The input voltage is too low; 4) The wiring is wrong.
IPM Module is damaged and it is needed to replace the mainboard. The possible causes include:
① The screw fixing the module is not tightened; ② Severely overloaded; ③ Interference causes short circuit inside IPM module.
Yes
If the pre-stage AC contactor is linked together?
No
The system is abnormal: Please check if the wiring or winding of the compressor is short circuited or incurred to other faults
PFC inductance insulation is damaged?
No
Yes
AC contactor is damaged. Replace with the same contactor.
Replace PFC inductance
Check if the wiring is wrong.
Make records correctly and report.

Fig. 3.3.2.3 Tripping Inspection Process

3.3.2.4 Abnormal Noise from PFC Inductance

Generally, it is normal that the inductance will send out continuous and slight “ZHI ZHI” sound. The abnormal noise of inductance refers to continuous “DU DU”, “PI PA” or “BI BI” sound easy to hear by human ears. The possible reasons causing PFC inductance noise include:

- PFC fault
- Inverter output is abnormal.

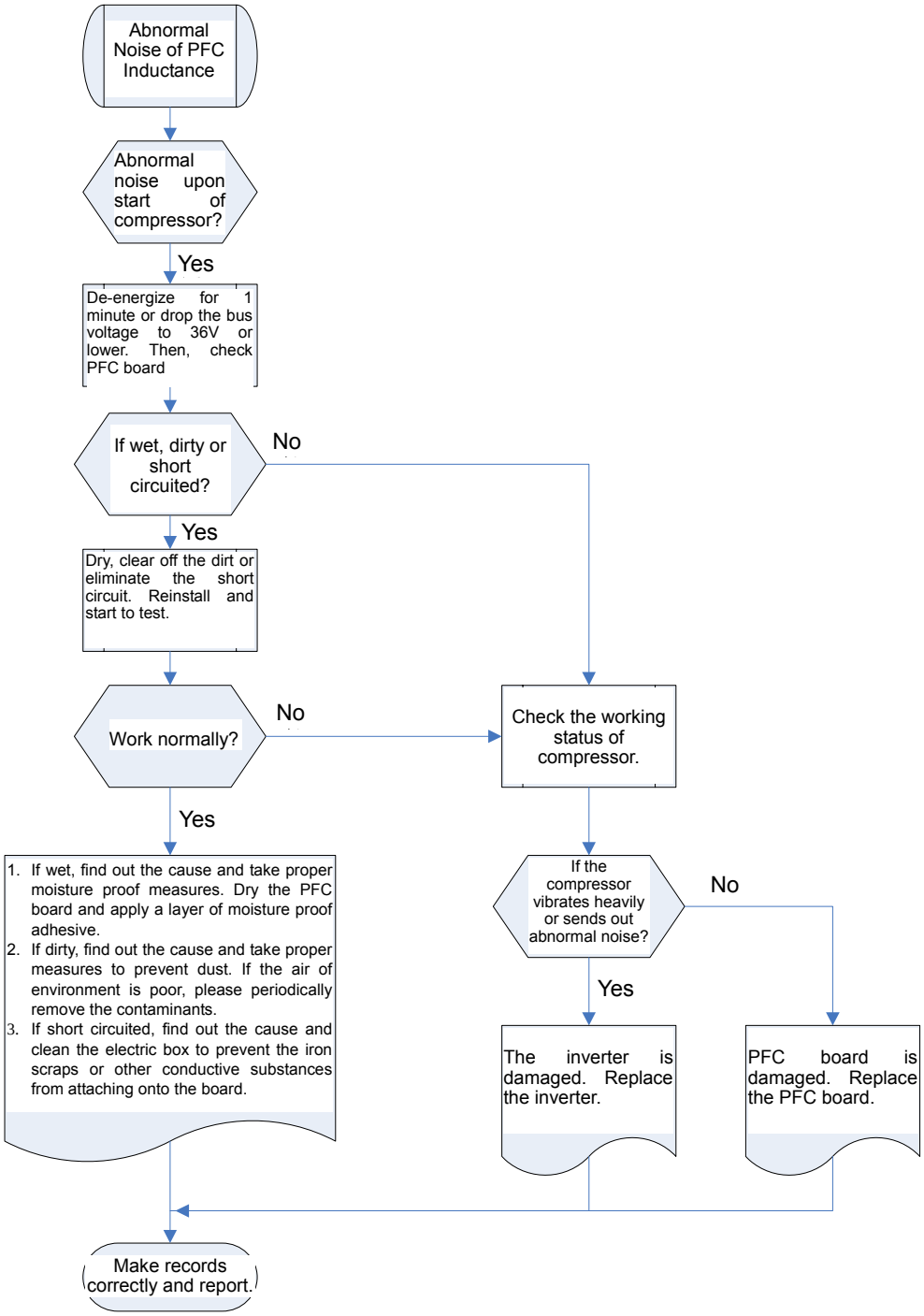

Abnormal Noise of PFC Inductance
Abnormal noise upon start of compressor?
Yes
De-energize for 1 minute or drop the bus voltage to 36V or lower. Then, check PFC board
If wet, dirty or short circuited?
No
Yes
Dry, clear off the dirt or eliminate the short circuit. Reinstall and start to test.
Work normally?
No
Check the working status of compressor.
Yes
1. If wet, find out the cause and take proper moisture proof measures. Dry the PFC board and apply a layer of moisture proof adhesive.
2. If dirty, find out the cause and take proper measures to prevent dust. If the air of environment is poor, please periodically remove the contaminants.
3. If short circuited, find out the cause and clean the electric box to prevent the iron scraps or other conductive substances from attaching onto the board.
If the compressor vibrates heavily or sends out abnormal noise?
No
Yes
The inverter is damaged. Replace the inverter.
PFC board is damaged. Replace the PFC board.
Make records correctly and report.

Fig. 3.3.2.4 Troubleshooting Process for Abnormal Noise of PFC Inductance

3.3.2.5 Radiator Overheating Protection

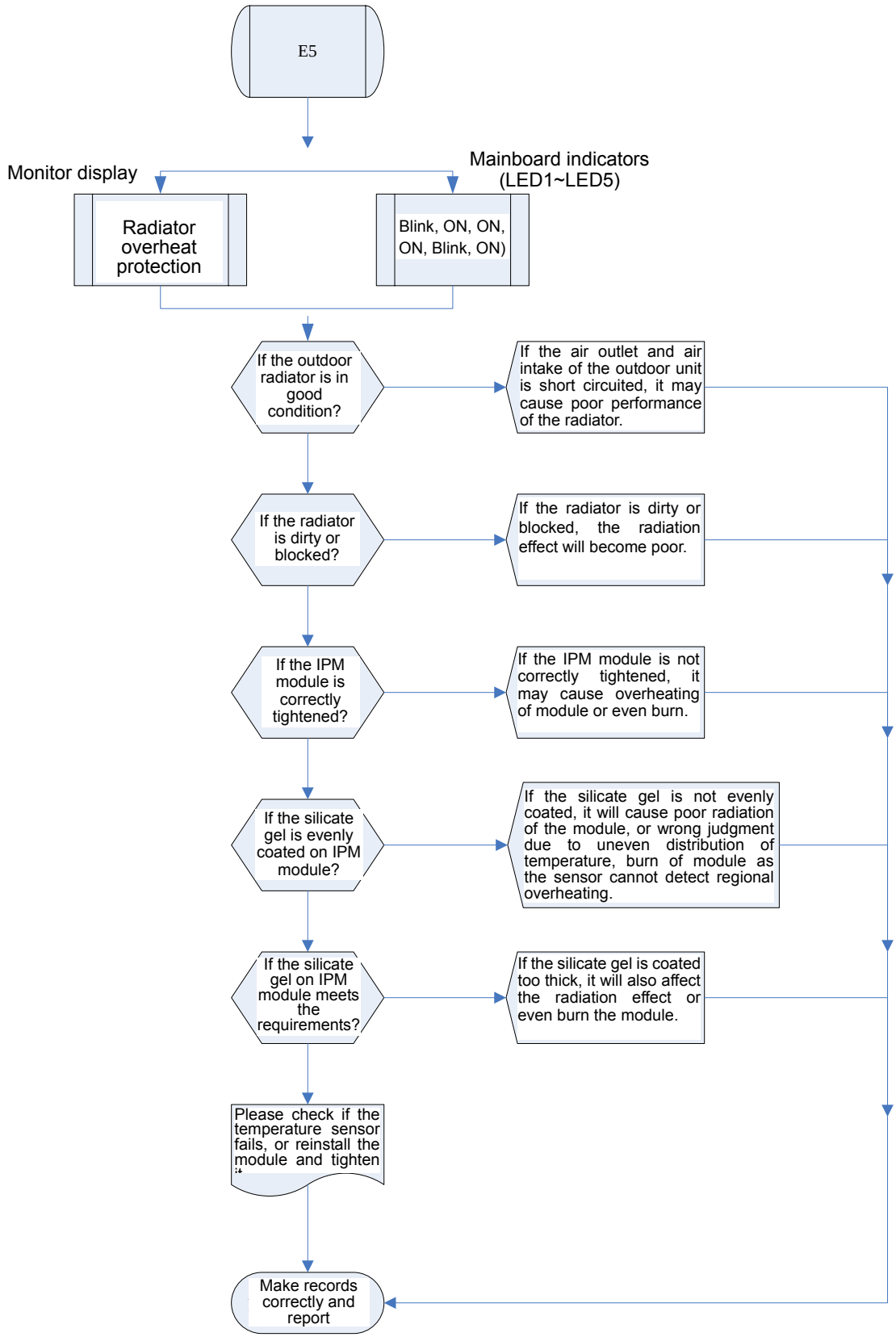

E5
Monitor display
Mainboard indicators (LED1~LED5)
Radiator overheat protection
Blink, ON, ON, ON, Blink, ON)
If the outdoor radiator is in good condition?
If the air outlet and air intake of the outdoor unit is short circuited, it may cause poor performance of the radiator.
If the radiator is dirty or blocked?
If the radiator is dirty or blocked, the radiation effect will become poor.
If the IPM module is correctly tightened?
If the IPM module is not correctly tightened, it may cause overheating of module or even burn.
If the silicate gel is evenly coated on IPM module?
If the silicate gel is not evenly coated, it will cause poor radiation of the module, or wrong judgment due to uneven distribution of temperature, burn of module as the sensor cannot detect regional overheating.
If the silicate gel on IPM module meets the requirements?
If the silicate gel is coated too thick, it will also affect the radiation effect or even burn the module.
Please check if the temperature sensor fails, or reinstall the module and tighten it.
Make records correctly and report

Fig. 3.3.2.5 Troubleshooting Process for Radiator Overheating Protection

3.3.2.6 DC Bus Overvoltage Protection

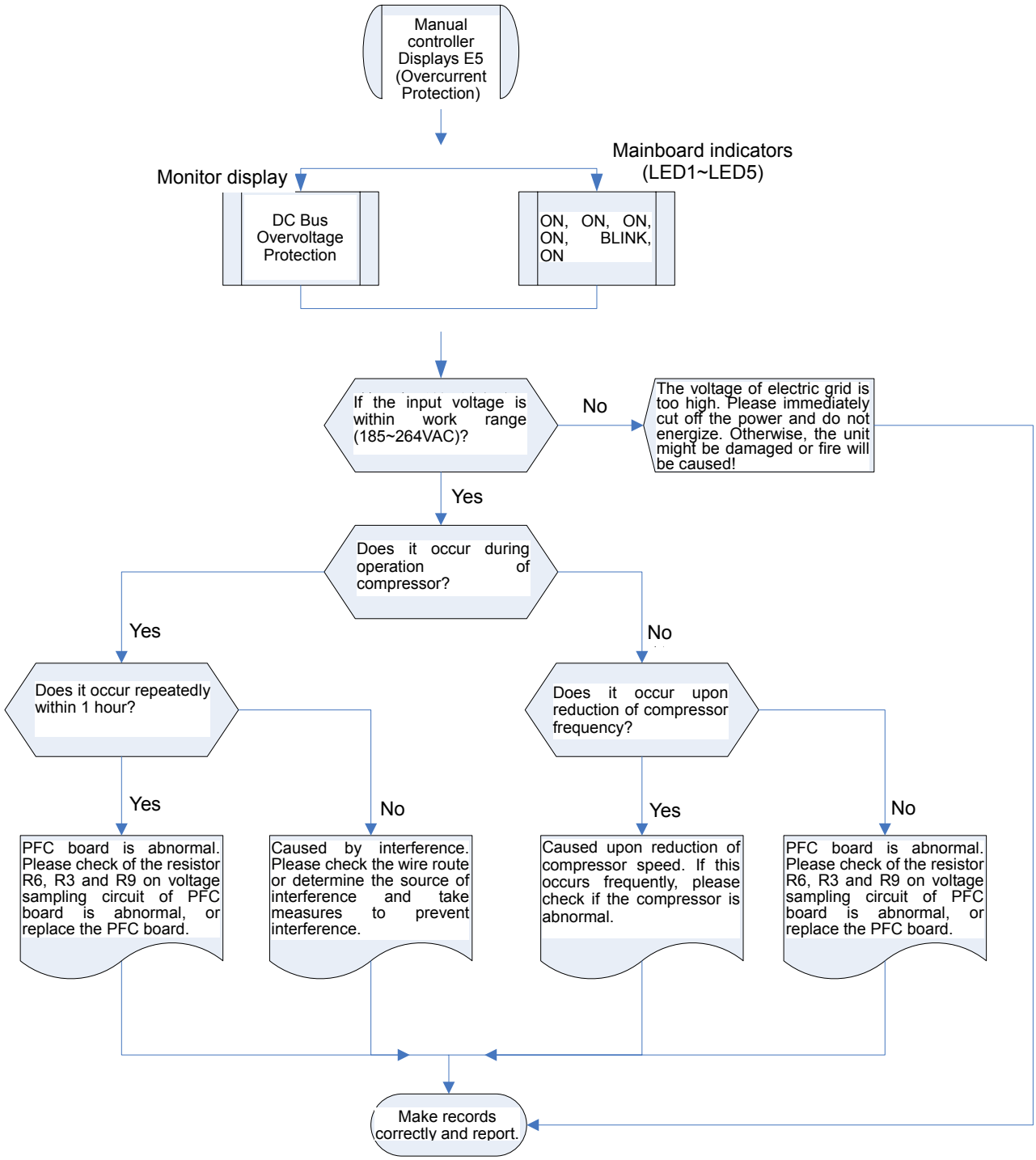

Manual controller Displays E5 (Overcurrent Protection)
Monitor display
Mainboard indicators (LED1~LED5)
DC Bus Overvoltage Protection
ON, ON, ON, ON, BLINK, ON
If the input voltage is within work range (185~264VAC)?
No
The voltage of electric grid is too high. Please immediately cut off the power and do not energize. Otherwise, the unit might be damaged or fire will be caused!
Yes
Does it occur during operation of compressor?
Yes
No
Does it occur repeatedly within 1 hour?
Does it occur upon reduction of compressor frequency?
Yes
No
Yes
No
PFC board is abnormal. Please check of the resistor R6, R3 and R9 on voltage sampling circuit of PFC board is abnormal, or replace the PFC board.
Caused by interference. Please check the wire route or determine the source of interference and take measures to prevent interference.
Caused upon reduction of compressor speed. If this occurs frequently, please check if the compressor is abnormal.
PFC board is abnormal. Please check of the resistor R6, R3 and R9 on voltage sampling circuit of PFC board is abnormal, or replace the PFC board.
Make records correctly and report.

Fig. 3.3.2.6 Troubleshooting Process for DC Bus Overvoltage Protection

3.3.2.7 DC Bus Undervoltage Protection

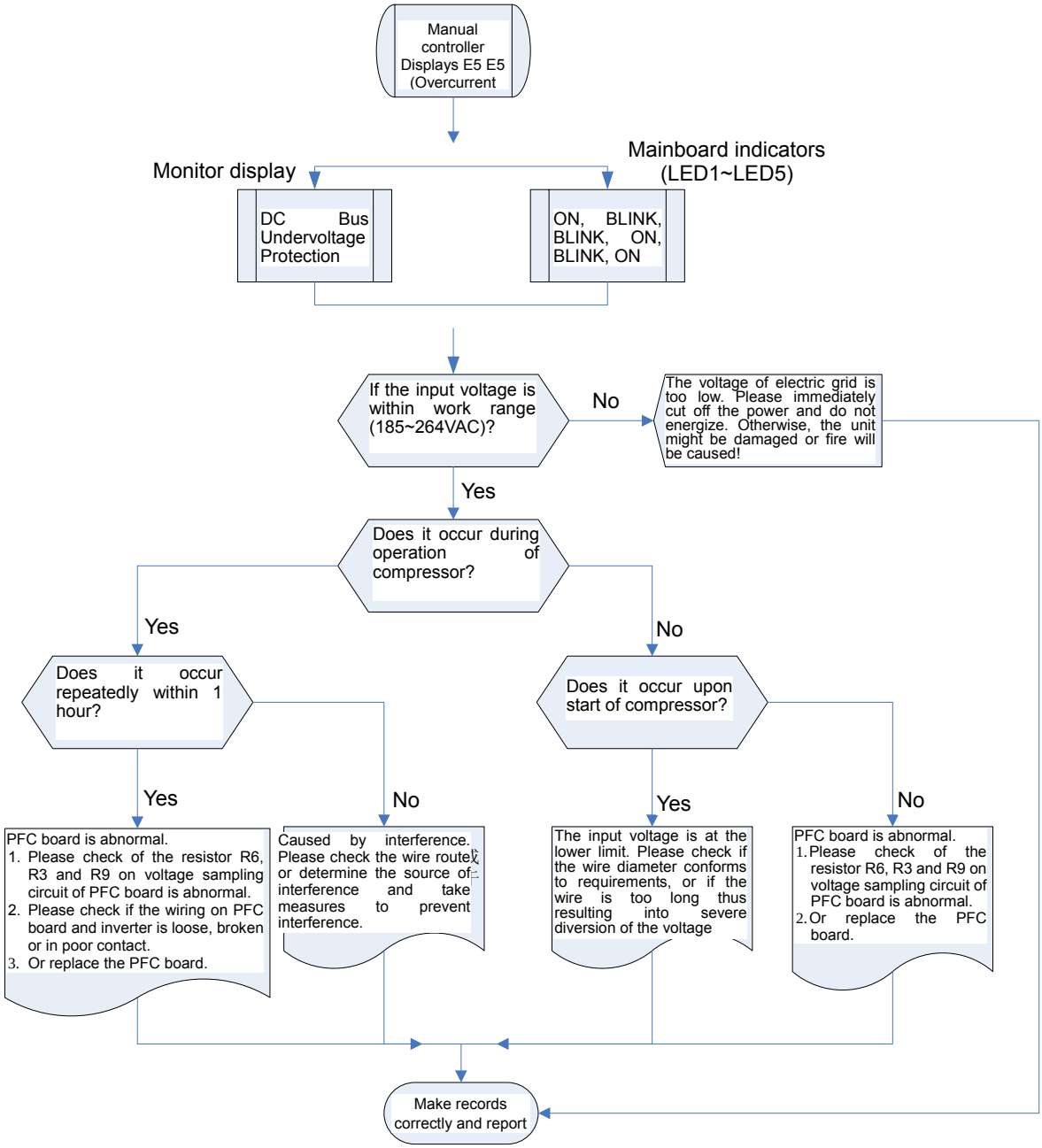

Manual controller Displays E5 E5 (Overcurrent
Monitor display
Mainboard indicators (LED1~LED5)
DC Bus Undervoltage Protection
ON, BLINK, BLINK, ON, BLINK, ON
If the input voltage is within work range (185~264VAC)?
No
The voltage of electric grid is too low. Please immediately cut off the power and do not energize. Otherwise, the unit might be damaged or fire will be caused!
Yes
Does it occur during operation of compressor?
Yes
No
Does it occur repeatedly within 1 hour?
Does it occur upon start of compressor?
Yes
No
Yes
No
PFC board is abnormal.
1. Please check of the resistor R6, R3 and R9 on voltage sampling circuit of PFC board is abnormal.
2. Please check if the wiring on PFC board and inverter is loose, broken or in poor contact.
3. Or replace the PFC board.
Caused by interference. Please check the wire route or determine the source of interference and take measures to prevent interference.
The input voltage is at the lower limit. Please check if the wire diameter conforms to requirements, or if the wire is too long thus resulting into severe diversion of the voltage
PFC board is abnormal.
1. Please check of the resistor R6, R3 and R9 on voltage sampling circuit of PFC board is abnormal.
2. Or replace the PFC board.
Make records correctly and report

Fig. 3.3.2.7 Troubleshooting Process for DC Bus Undervoltage Protection

3.4 Troubleshooting for Typical Faults of Inverter ASGE-36AI-3, ASGE-42AI-3

The model of mainboard used in this system is as follows:

ZB WZ863 Fig7

ZB Z814B Fig8

ZB WZ814A Fig9

3.4.1 WZ863 PCB Fault Code

Table 3 WZ863 PCB LED Indication Code

Item	WZ863 PCB LED Indication			Display Indication
	LED1 (red)	LED2 (yellow)	LED3 (green)	
11 Normal Mode	Blink	OFF	OFF	E5
IPM Module Protection	Blink	OFF	Blink	E5
Voltage Protection	Blink	Blink	OFF	E5
Compressor Current Protection	Blink	Blink	Blink	E5
Communication Fault from Inverter to Main Controller	OFF	Blink	Blink	E5
Loss-of-Synchronization Protection	Blink	ON	ON	E5
Current Sensor Fault	Blink	Blink	ON	E5
Sensor Connection Protection	ON	ON	Blink	E5
Radiator Fin Overheat Protection	ON	Blink	ON	E5
Radiator Fin Sensor Fault	OFF	Blink	ON	E5
Wrong Mode	ON	OFF	Blink	E5

3.4.2 Troubleshooting for Inverter Faults

1) IPM Module Protection: This protection occurs as long as it is detected that the FO of IPM module has low level. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
2) Voltage Protection: When there is no other fault 2s after energization, it is detected for 2ms successively that the bus voltage is higher than 725V or lower than 375V. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
3) Compressor Current Protection: When there is no other fault 2s after energization, it is detected for 600us successively that the transient current of compressor is higher than 48A. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
4) Communication Fault from Inverter to Main Controller: The inverter cannot communicate normally with the main controller for 12s successively. This fault can

be restored automatically.

5) Loss-of-Synchronization Protection: When there is no other fault, it is detected for 2s successively that the negative potential is lower than 20v during operation of the compressor. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
6) Current Sensor Fault: When there is no other fault 2s after energization, it is detected in 1s that the average bias voltage is higher than 20% of 3V. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
7) Sensor Connection Protection: The current sensor is not connected to corresponding U or V phase, or the direction of connection is incorrect.
8) Radiator Overheat Protection: When there is no other fault 2s after energization, it is detected for 2ms successively that the radiator temperature is higher than 90□. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
9) Radiator Sensor Fault: When there is no other fault 2s after energization, it is detected for 2ms successively that the radiator sensor is short circuit or open circuit. It is non-restorable if this protection occurs six times successively in 1 hour. In this case, you must de-energize, discharge completely and re-energize before you can eliminate this fault.
10) Mode Error: The main control board and inverter is not under quick measuring mode at the same time, or the main control board and inverter is not under normal mode at the same time.

3.4.3 WZ863 PCB Troubleshooting

3.4.3.1 Inverter Module Protection

The possible reasons causing inverter module protection include:

- The screws fixing IPM module are not correctly tightened.
- Radiation of IPM module is poor.
- Interference.
- The IPM module is damaged.
- +15V voltage of power board is abnormal.
- The compressor is abnormal.

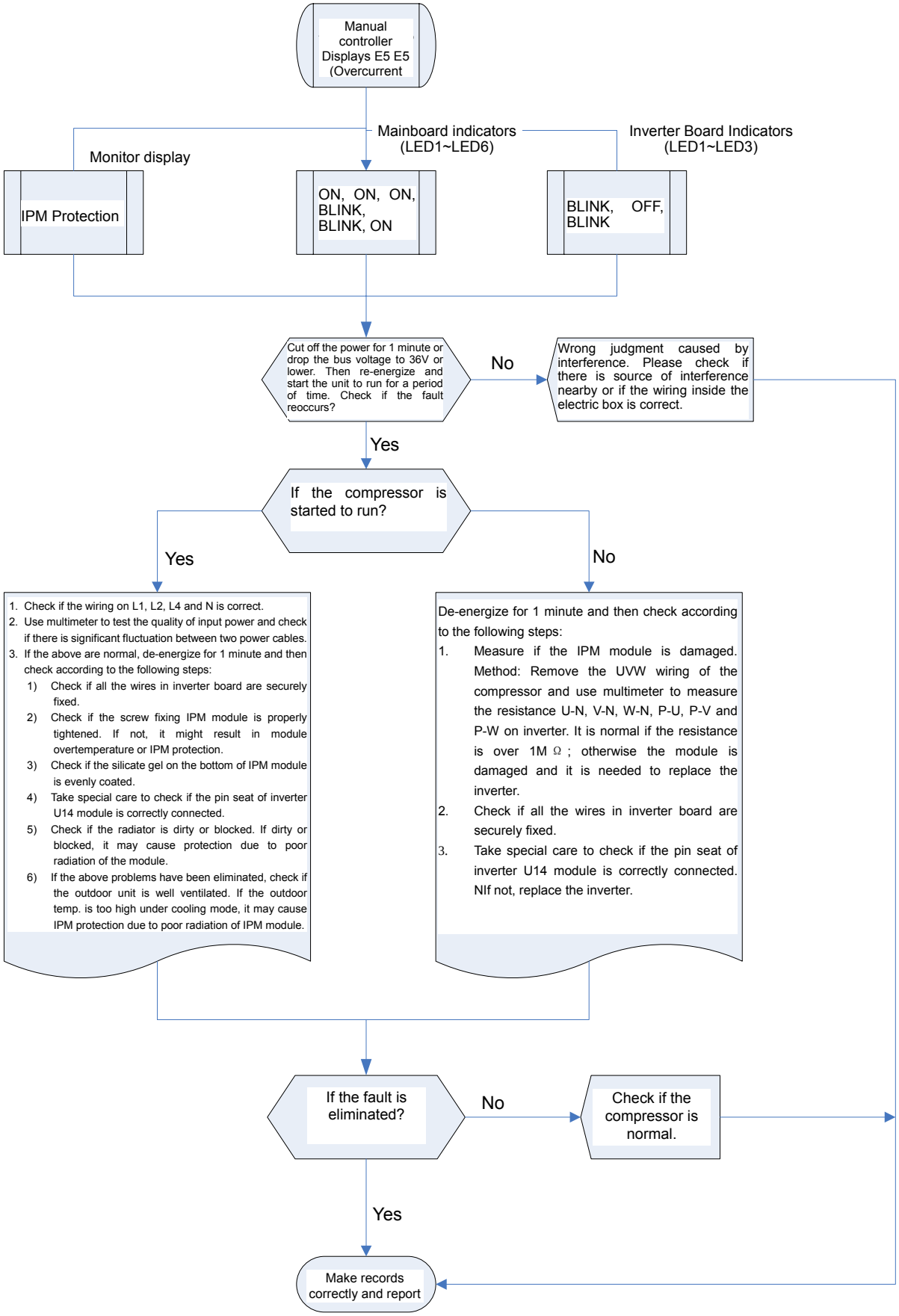

Manual controller Displays E5 E5 (Overcurrent
Mainboard indicators (LED1~LED6)
Inverter Board Indicators (LED1~LED3)
Monitor display
IPM Protection
ON, ON, ON, BLINK, BLINK, ON
BLINK, OFF, BLINK
Cut off the power for 1 minute or drop the bus voltage to 36V or lower. Then re-energize and start the unit to run for a period of time. Check if the fault reoccurs?
No
Wrong judgment caused by interference. Please check if there is source of interference nearby or if the wiring inside the electric box is correct.
Yes
If the compressor is started to run?
Yes
No
1. Check if the wiring on L1, L2, L4 and N is correct.
2. Use multimeter to test the quality of input power and check if there is significant fluctuation between two power cables.
3. If the above are normal, de-energize for 1 minute and then check according to the following steps:
1) Check if all the wires in inverter board are securely fixed.
2) Check if the screw fixing IPM module is properly tightened. If not, it might result in module overtemperature or IPM protection.
3) Check if the silicate gel on the bottom of IPM module is evenly coated.
4) Take special care to check if the pin seat of inverter U14 module is correctly connected.
5) Check if the radiator is dirty or blocked. If dirty or blocked, it may cause protection due to poor radiation of the module.
6) If the above problems have been eliminated, check if the outdoor unit is well ventilated. If the outdoor temp. is too high under cooling mode, it may cause IPM protection due to poor radiation of IPM module.
De-energize for 1 minute and then check according to the following steps:
1. Measure if the IPM module is damaged. Method: Remove the UVW wiring of the compressor and use multimeter to measure the resistance U-N, V-N, W-N, P-U, P-V and P-W on inverter. It is normal if the resistance is over 1M Ω ; otherwise the module is damaged and it is needed to replace the inverter.
2. Check if all the wires in inverter board are securely fixed.
3. Take special care to check if the pin seat of inverter U14 module is correctly connected. NIf not, replace the inverter.
If the fault is eliminated?
No
Check if the compressor is normal.
Yes
Make records correctly and report

Fig. 3.4.3.1 Troubleshooting Process for Inverter Module Protection

3.4.3.2 Tripping

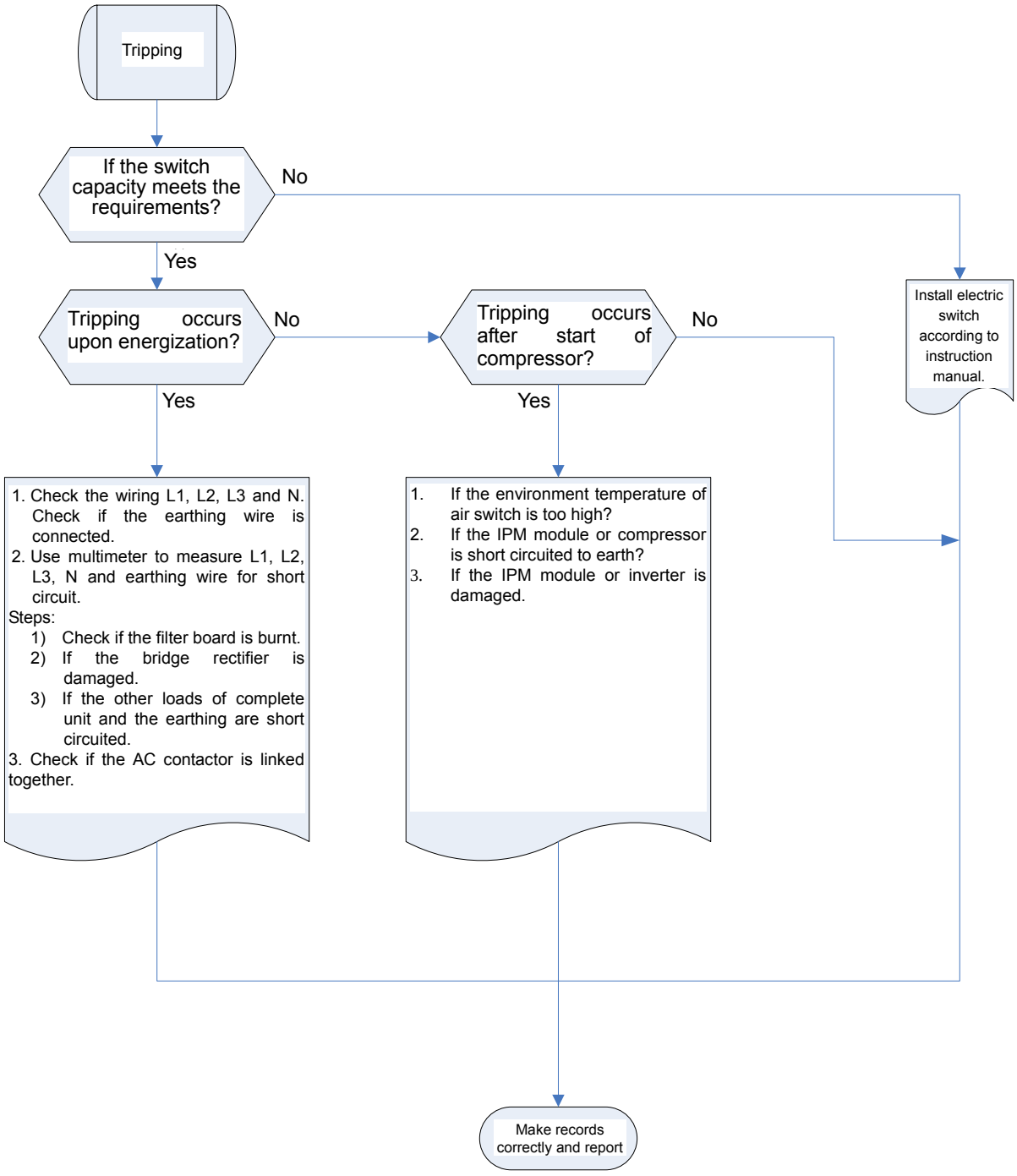

Tripping
If the switch capacity meets the requirements?
No
Yes
Tripping occurs upon energization?
No
Yes
Tripping occurs after start of compressor?
No
Yes
Install electric switch according to instruction manual.
1. Check the wiring L1, L2, L3 and N. Check if the earthing wire is connected.
2. Use multimeter to measure L1, L2, L3, N and earthing wire for short circuit.
Steps:
1) Check if the filter board is burnt.
2) If the bridge rectifier is damaged.
3) If the other loads of complete unit and the earthing are short circuited.
3. Check if the AC contactor is linked together.
1. If the environment temperature of air switch is too high?
2. If the IPM module or compressor is short circuited to earth?
3. If the IPM module or inverter is damaged.
Make records correctly and report

Fig.3.4.3.2 Tripping Inspection Process

3.4.3.3 DC Bus Overvoltage Protection and DC Bus Undervoltage Protection

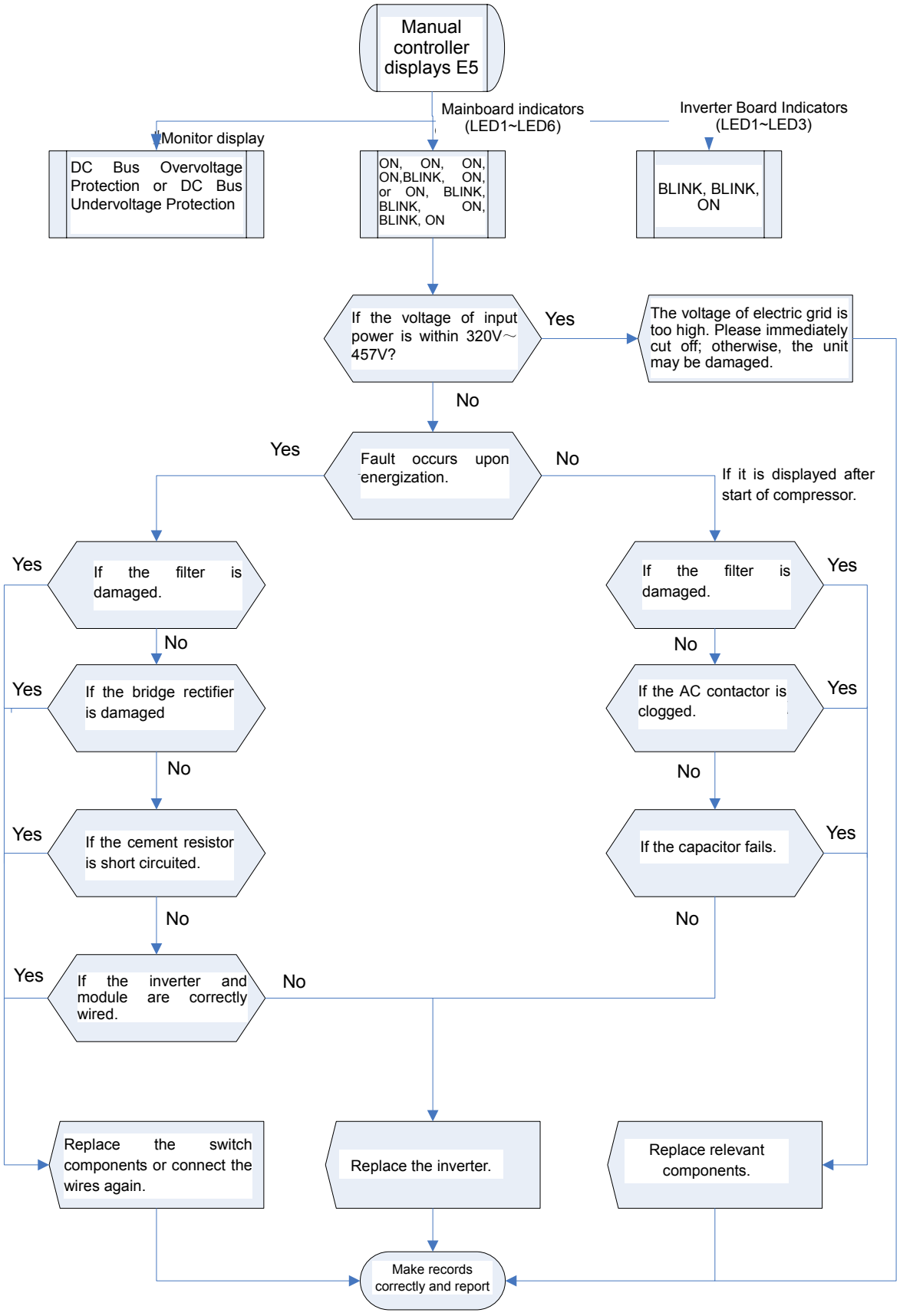

Manual controller displays E5
Mainboard indicators (LED1~LED6)
Inverter Board Indicators (LED1~LED3)
Monitor display
DC Bus Overvoltage Protection or DC Bus Undervoltage Protection
ON, ON, ON, ON,BLINK, ON, or ON, BLINK, BLINK, ON, BLINK, ON
BLINK, BLINK, ON
If the voltage of input power is within 320V～457V?
Yes
The voltage of electric grid is too high. Please immediately cut off; otherwise, the unit may be damaged.
No
Fault occurs upon energization.
Yes
No
If it is displayed after start of compressor.
If the filter is damaged.
If the bridge rectifier is damaged
If the cement resistor is short circuited.
If the inverter and module are correctly wired.
If the AC contactor is clogged.
If the capacitor fails.
Replace the switch components or connect the wires again.
Replace the inverter.
Replace relevant components.
Make records correctly and report

Fig. 3.4.3.3 Troubleshooting Process for DC Bus Overvoltage Protection and DC Bus Undervoltage Protection

3.4.3.4 Radiator Overheating Protection

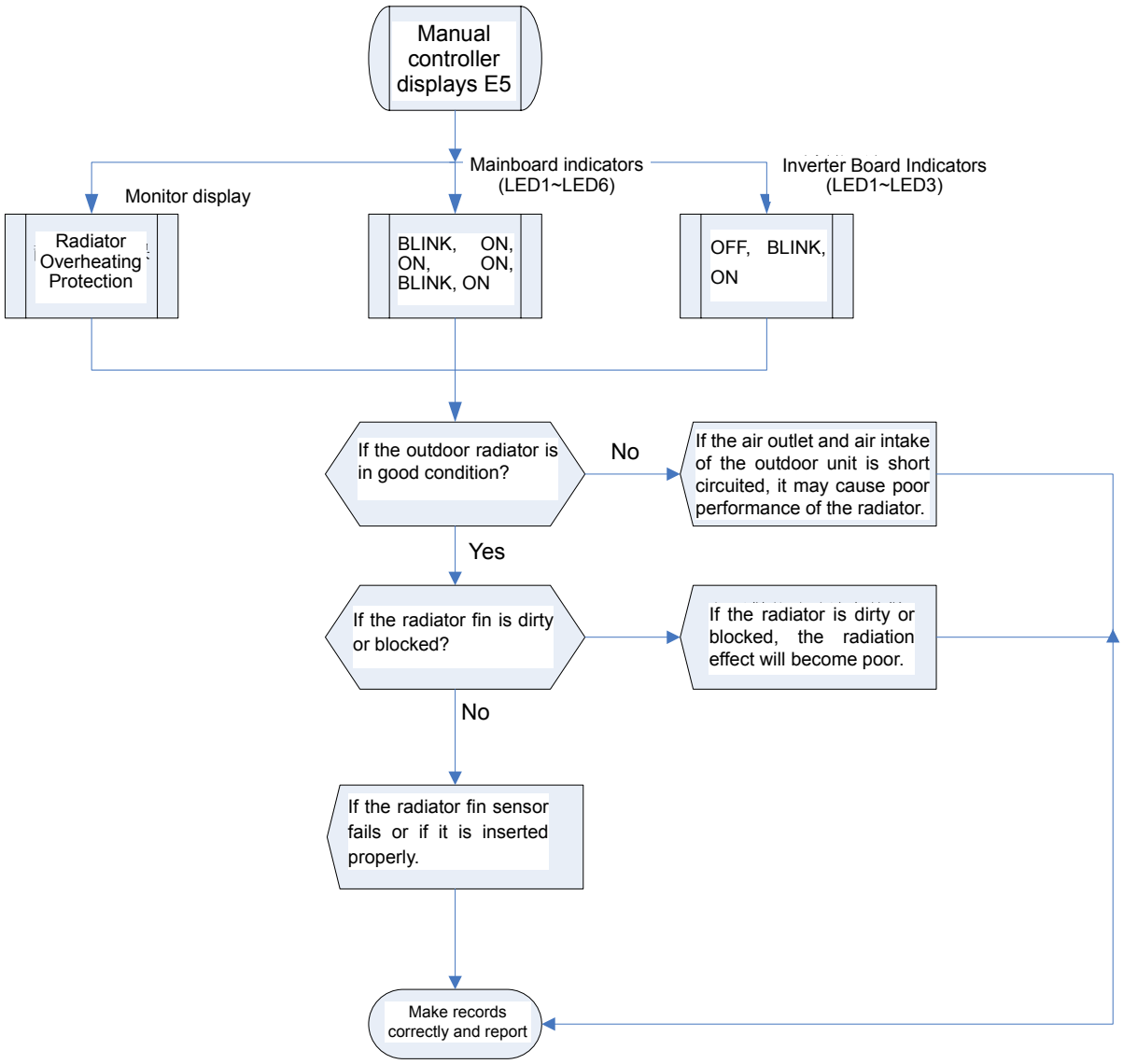

Manual controller displays E5
Mainboard indicators (LED1~LED6)
Inverter Board Indicators (LED1~LED3)
Monitor display
Radiator Overheating Protection
BLINK, ON, ON, ON, BLINK, ON
OFF, BLINK, ON
If the outdoor radiator is in good condition?
No
If the air outlet and air intake of the outdoor unit is short circuited, it may cause poor performance of the radiator.
Yes
If the radiator fin is dirty or blocked?
If the radiator is dirty or blocked, the radiation effect will become poor.
No
If the radiator fin sensor fails or if it is inserted properly.
Make records correctly and report

Fig. 3.4.3.4 Troubleshooting Process for Radiator Overheating Protection

3.4.3.5 Sensor Connection Protection

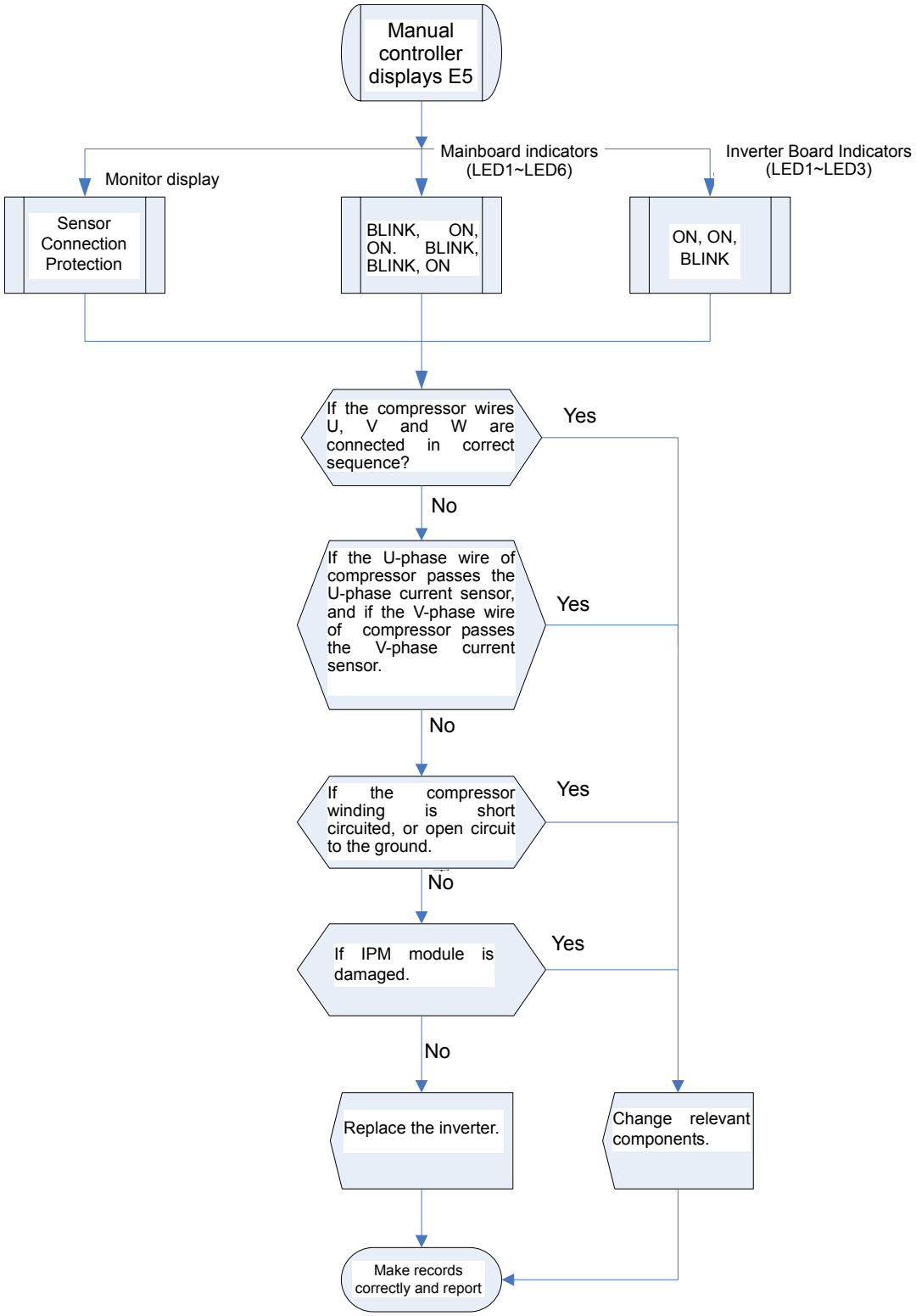
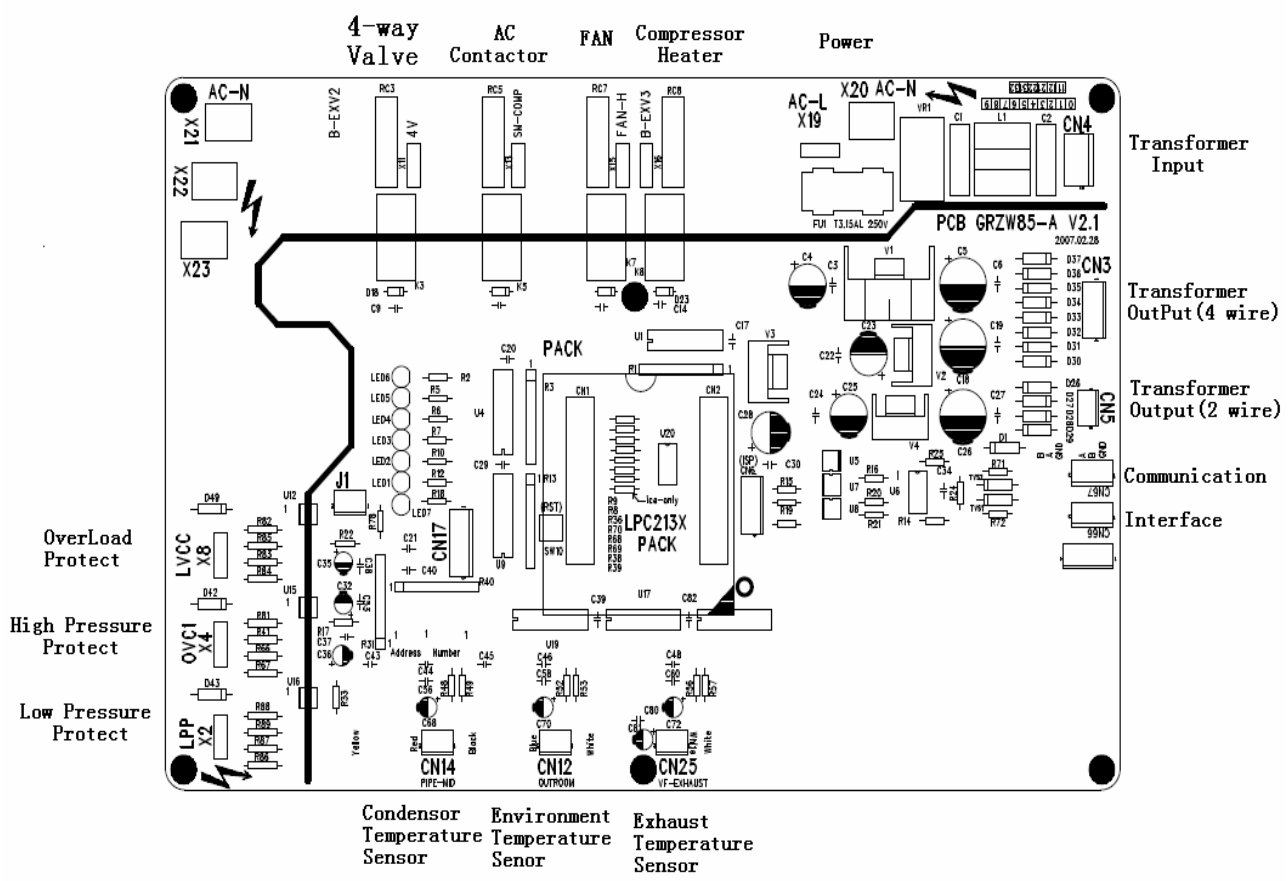

Manual controller displays E5
Mainboard indicators (LED1~LED6)
Monitor display
Inverter Board Indicators (LED1~LED3)
Sensor Connection Protection
BLINK, ON, ON. BLINK, BLINK, ON
ON, ON, BLINK
If the compressor wires U, V and W are connected in correct sequence?
Yes
No
If the U-phase wire of compressor passes the U-phase current sensor, and if the V-phase wire of compressor passes the V-phase current sensor.
Yes
No
If the compressor winding is short circuited, or open circuit to the ground.
Yes
No
If IPM module is damaged.
Yes
No
Replace the inverter.
Change relevant components.
Make records correctly and report

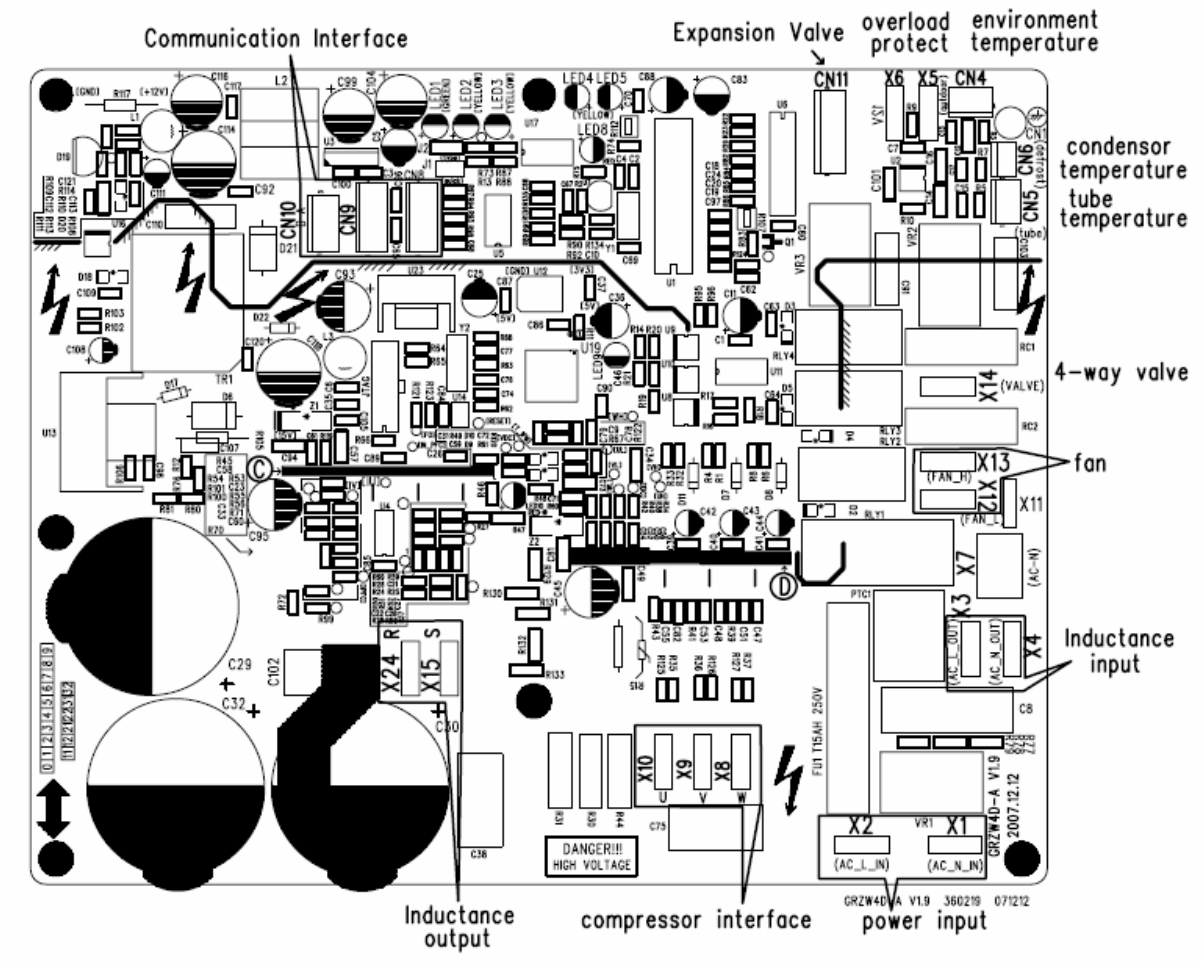
Fig. 3.4.3.5 Troubleshooting Process for Sensor Connection Protection

Appendix: Interface Diagram for Each Mainboard



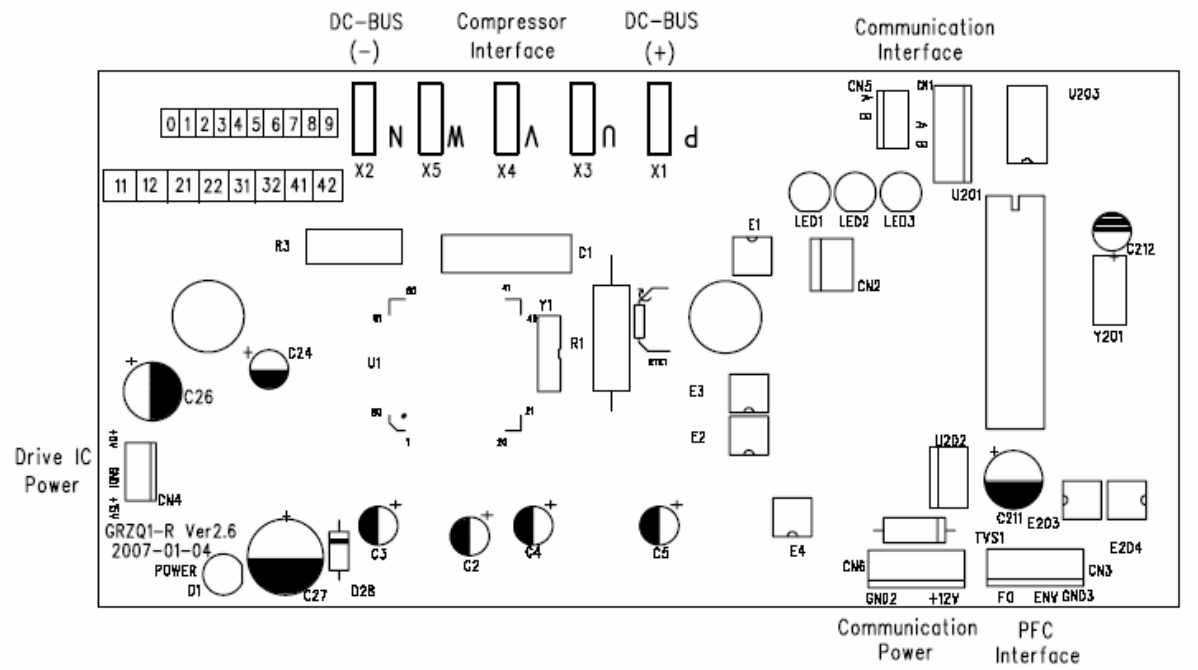
	Silkscreen	Interface
ZB1 WZ4D35 ZB1 WZ4D15	AC-L	Power Live Wire
	AC-N	Power Neutral Wire
	CN12	Outdoor Ambient Sensor
	CN14	Condenser Temp. Sensor
	CN25	Exhaust Temp. Sensor
	X2（LPP）	LV Protection Switch
	X4(OVC1)	HV Protection Switch
	X8(LVCC)	Overload Protection Switch on Compressor
	X11	4-way Valve
	X13	AC Contactor
	X15	Outdoor Fan
	X16	Compressor with Electric Heater
	CN17	Electronic Expansion Valve
	CN65、CN66、CN67	Communication Wire

Fig 1　ZB1 WZ4D35, ZB1 WZ4D15　PCB Interface Diagram



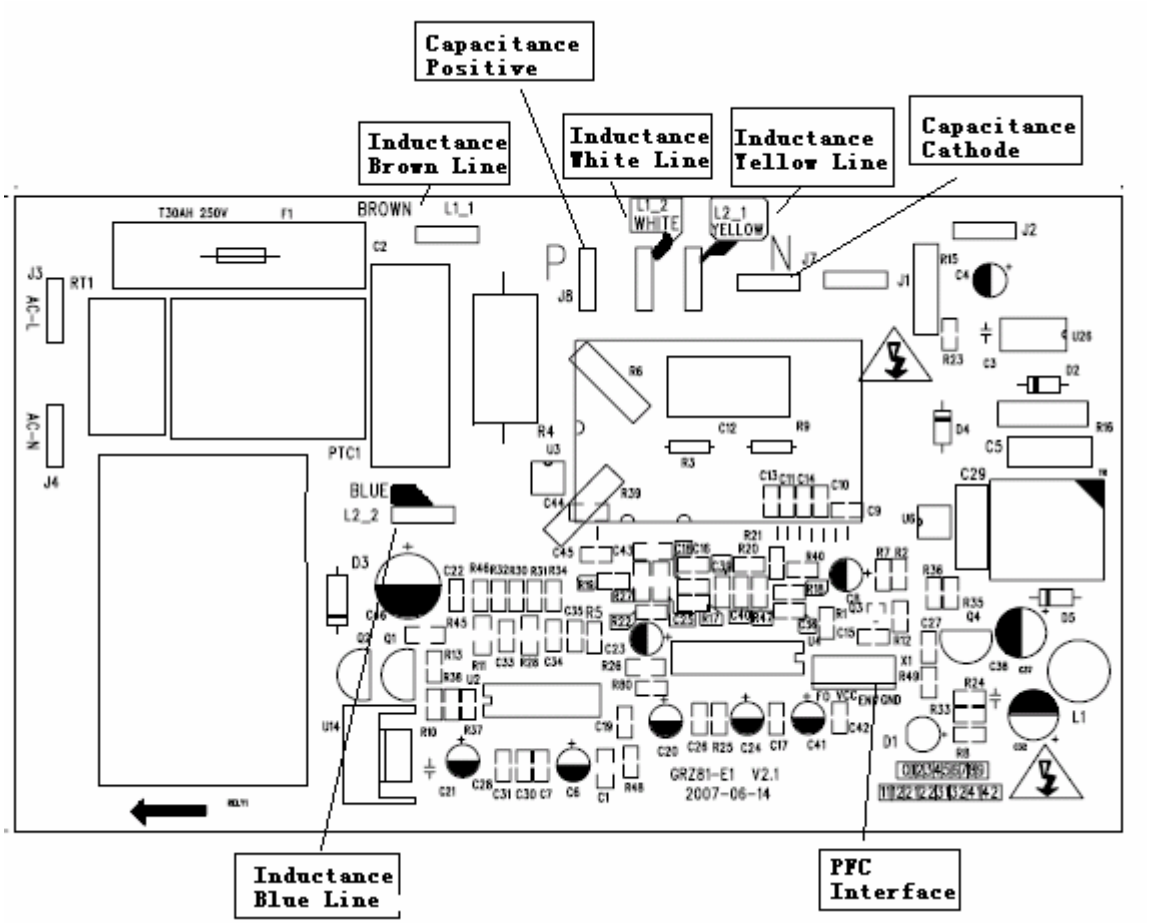
	Silkscreen	Interface
WZ4D35A WZ4D15A	X2	Power Live Wire
	X1	Power Neutral Wire
	CN4	Outdoor Ambient Sensor
	CN6	Condenser Temp. Sensor
	CN5	Tube Temp. Sensor
	X5、X6	Overload Protection Switch on Compressor
	X14	4-way Valve
	X12、X13	Outdoor Fan
	X8、X9、X10	Compressor Interface
	X3、X4、X15、X24	PFC Inductance Interface
	CN11	Electronic Expansion Valve
	CN8、CN9、CN10	Communication Wire

Fig 2　Interface Diagram　for Mainboard 50 or Below



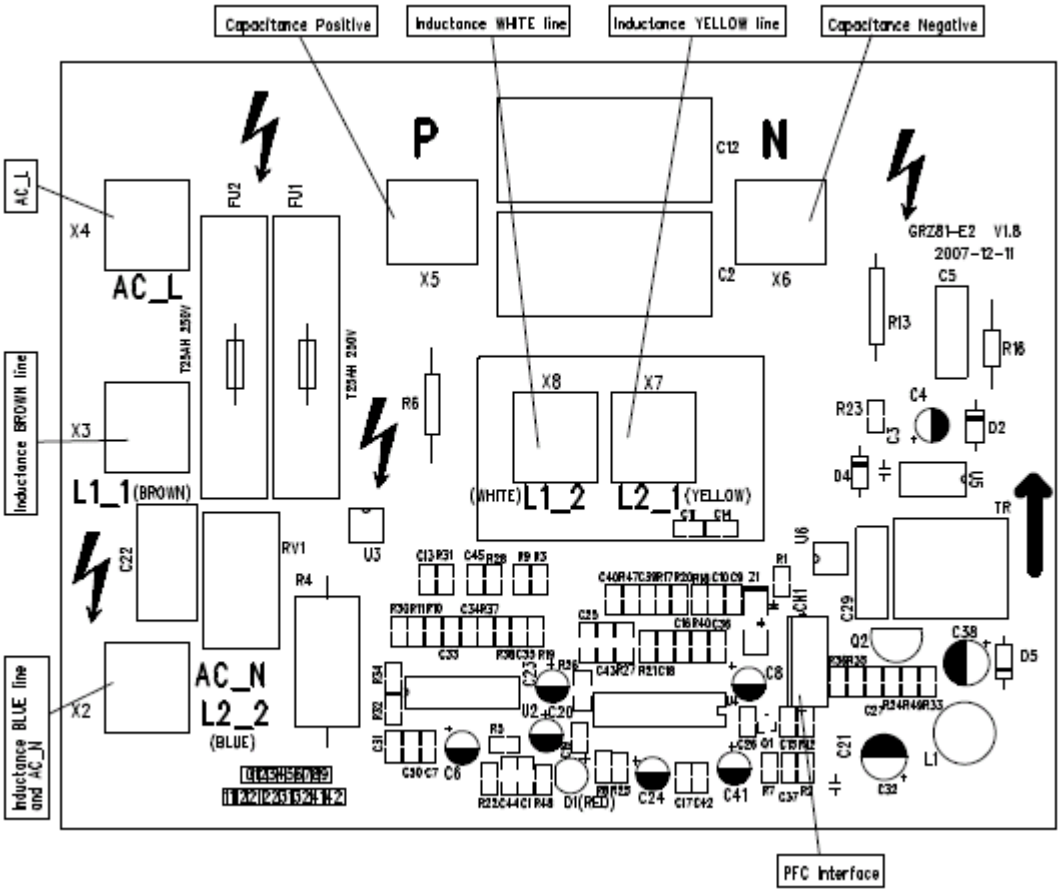
	Silkscreen	Interface
ZQ101	X1	DC-BUS(+)
	X2	DC-BUS(-)
	X3、X4、X5	Compressor Interface
	CN1、CN5	Communication Interface
	CN4	Drive IC Power
	CN6	Communication Power
	CN3	PFC Interface

Fig 3　ZQ101　PCB Interface Diagram



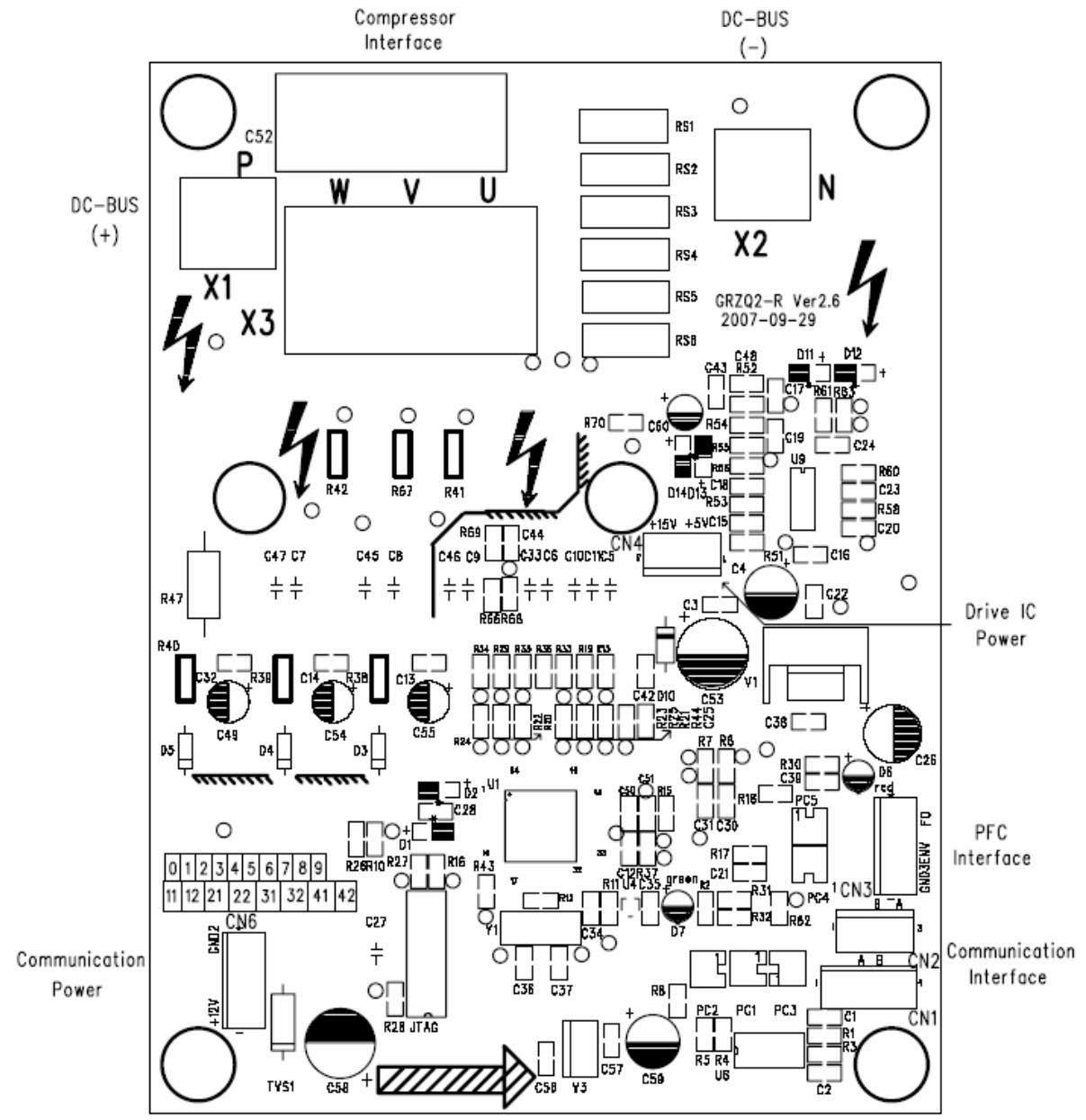
	Silkscreen	Interface
Z81P	L1_1	Inductance Brown Line
	L1_2	Inductance White Line
	L2_1	Inductance Yellow Line
	L2_2	Inductance Blue Line
	J8	Capacitance Positive
	J7	Capacitance Cathode
	J3	AC-L
	J4	AC-N
	X1	PFC Interface

Fig. 4 70 Unit PFC Interface Diagram



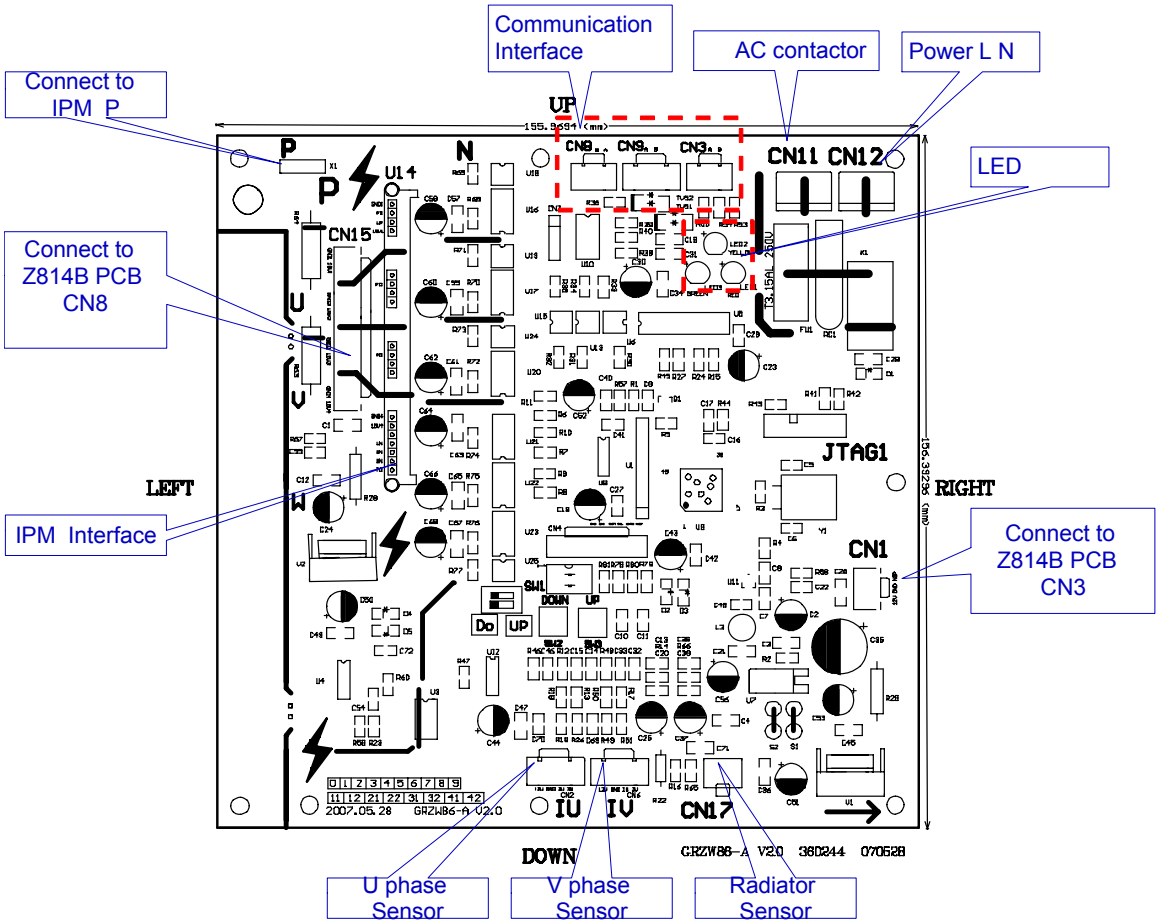
	Silkscreen	Interface
Z81PA	X3	Inductance Brown Line
	X8	Inductance White Line
	X7	Inductance Yellow Line
	X2	Inductance Blue Line
	X5	Capacitance Positive
	X6	Capacitance Negative
	X4	AC-L
	X2	AC-N
	CN1	PFC Interface

Fig5 100～160PFC Interface Diagram and Chart



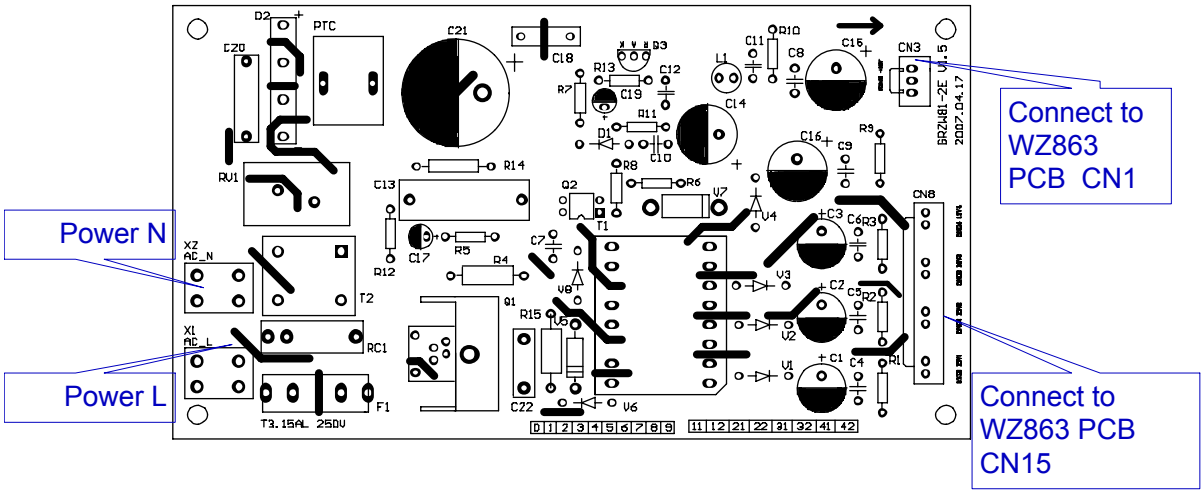
	Silkscreen	Interface
ZQ201	X1	DC-BUS(+)
	X2	DC-BUS(-)
	X3	Compressor Interface
	CN1、CN2	Communication Interface
	CN4	Drive IC Power
	CN6	Communication Power
	CN3	PFC Interface

Fig.6 ZQ201 PCB Interface Diagram



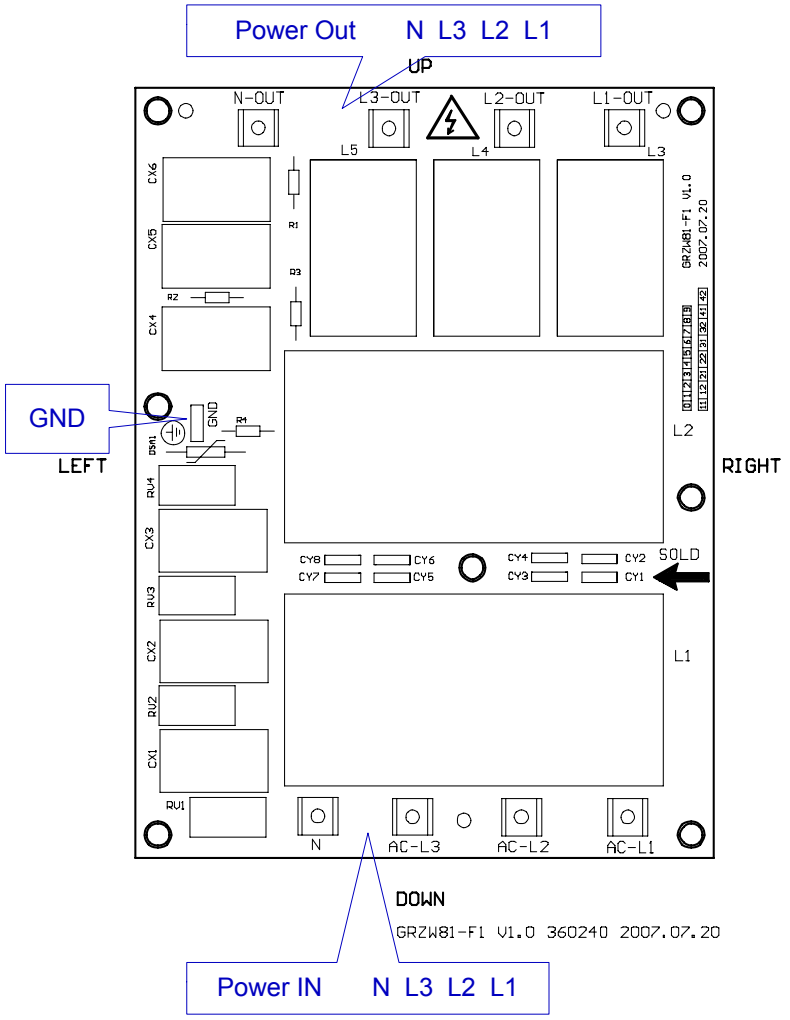
	Silkscreen	Interface
WZ863	P	To DC bus, for measuring the Vdc.
	CN15	Power supply from switch power
	U14	Quick connector of module
	CN1	Power supply from switch power
	CN8,CN9,CN3	485 communication, for communicating with main control board (Different interface shall be selected if matched to different main control boards)
	CN11	Power 220V
	CN2	AC contactor control interface
	IU	To U-phase current sensor
	IV	To V-phase current sensor
	CN17	Radiator Temp. Sensor

Fig.7 Three-phase Inverter (ZB WZ863) Interface Diagram



	Silkscreen	Interface
Z814B	X1	Live Wire
	X2	Neutral Wire
	CN8	To 14-cord Wire
	CN3	To 3-cord Wire

Fig8 ZB Z814B Interface Diagram



	Silkscreen	Interface
WZ814A	AC_L1	Inlet L1
	AC_L2	Inlet L2
	AC_L3	Inlet L3
	N	Inlet N
	L1_OUT	Outlet L1
	L2_OUT	Outlet L2
	L3_OUT	Outlet L3
	N_OUT	Outlet N

Fig9 ZB WZ814A Interface Diagram

3 Installation and Debugging

3.1 Installation of Outdoor Unit

3.1.1 Selection and Requirements of Installing Location

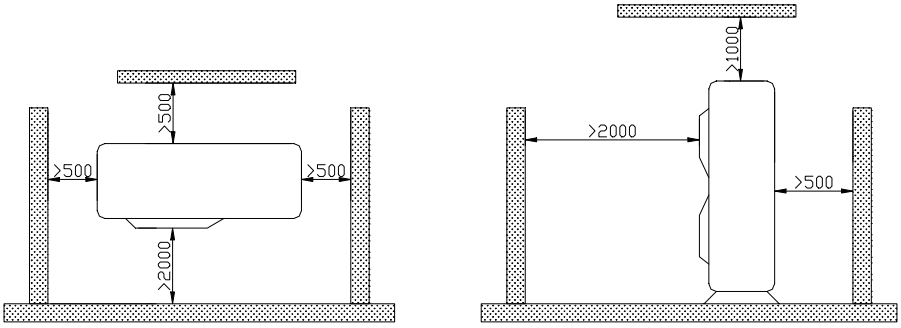


Fig.3-1-1

The unit shall so installed that enough space shall be maintained around to ensure good air return and heat radiation. To ensure proper operation of the unit, the selection of installing position must be in strict accordance with the following principles:

 The outdoor unit shall be installed at a position where the exhaust air will not flow back. Around the machine, maintain enough space for repair work.

 The install position must be well ventilated so that the machine can suck and discharge enough air. Ensure there is no obstruction at the air inlet and outlet of the machine. If any, remove the obstructions blocking the air flow.

 The installing position shall be strong enough to support the weight of outdoor unit. Sound insulation and shock absorption shall be provided. Make sure that the outlet air and noise from the unit will not affect the neighbor.

 The outdoor unit must be lifted from the designated hoisting hole. During lift, take care to protect the machine. To prevent rusting in the future, it is prohibited to damage the plating parts.

 Avoid direct sunshine.

 The installing positions must be able to drain the rainwater and defrost water.

 The installing position shall ensure that the machine will not be buried under the snow or affected by wastes or oil fog.

 To meet the noise and vibration requirements, install the outdoor unit with rubber damping cushion or spring damper.

 The installation size shall conform to the specification. The outdoor unit must be fixed at the position where it is installed.

The installation shall be carried out by professional technicians.

3.1.2 Precautions on Installation of Outdoor Unit

1) Fix the outdoor unit with M10 bolts and nuts if it is installed on solid ground like concrete. And ensure that the outdoor unit is vertically standing and well leveled.
2) Do not install the unit at the top of the construction.
3) If noise is heard from vibration, please add rubber cushion between outdoor unit and installation base.
4) When operating under heating or defrosting mode, the outdoor unit shall be provided with water drainage treatment.
5) To install the water drainage pipe, please insert the drainage connector to the drainage hole on the chassis of outdoor unit and then connect a drainage hose to the drainage connector. (If drainage connector is used, the installing height of outdoor unit shall be 5cm at least).

3.1.3 Installation of Connection Pipe

Selection of connection pipe, as shown in Table 3-1

Table 3-1

Item / Model	Pipe Size (mm)		Max. Pipe Length (m)	Max. Height Difference between Indoor and Outdoor Unit (m)	Additional Refrigerant (Excessive Length of Pipe)
	Gas Pipe	Liquid Pipe			
ASGE-18AI	1/4 "	1/2 "	20	15	20
ASGE-24AI	Φ9.52	Φ16	30	15	60g/m
ASGE-36AI / ASGE-36AI-3	Φ12	Φ19	50	30	120g/m
ASGE-42AI-3					

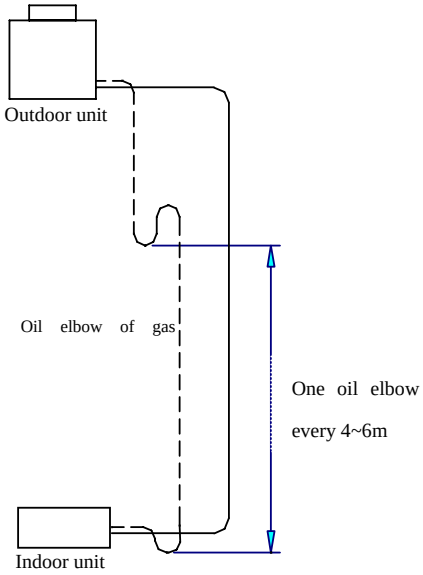
The layout of connection pipes shall be based on site conditions in reference to the following principles:

1. Shorten the length of connection pipe to minimum, best within 5m.
2. Reduce the height difference of indoor and outdoor units to minimum.
3. Reduce the elbows of connection pipe to minimum.
4. If the connection pipe is longer than 20m, it is needed to check if the lubricating oil of the system is enough. Add if needed.
5. The refrigerant quantity inside this unit is suitable to connecting pipe 7m long. If the length of connection pipe is increased, add appropriate quantity of refrigerant accordingly. For each increase of the pipe length by 1m, the quantity of refrigerant to be added is shown as below. The max. permissible pipe length is 30m.
6. If the air conditioner is installed when the height difference between indoor and outdoor units is more than 10m, one oil return elbow shall be installed every 6 meters. The height of indoor unit is different from that of outdoor unit, please arrange the pipes

according to the diagram below.

——— Liquid pipe (i.e. small pipe)

- - - - - - Gas pipe (i.e. large pipe)



Outdoor unit higher than indoor unit

Fig. 3-1-2

1) Connection of Pipe

a) The connection pipe must meet the following requirements:

The three basic principles are to keep the pipe dry, clean and airtight.

The 3 principles of refrigerant piping

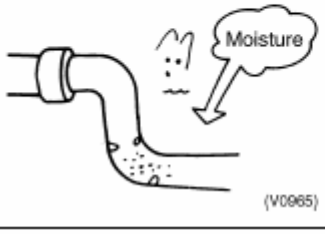
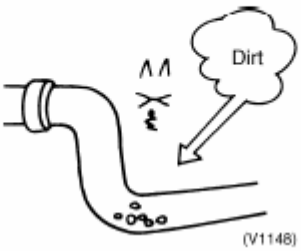
Dry	Clean	Air tight
Make sure there is no moisture inside the pipes	Make sure there is no dirt inside the pipe	Make sure the refrigerant does not leak out
		

Fig. 3-1-3

b) Align the flare of copper tube with the center of threaded connector and adequately tighten the flaring nut with your hands.

c) Use torque wrench to tighten the flaring nut until a “KA TA” sound is heard, as shown in Fig. 3-4. The torque for tightening of nut is shown in 3-1-5.

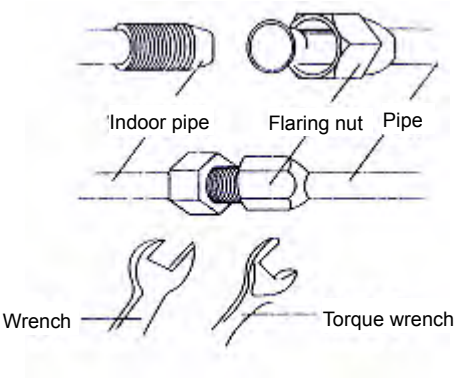


Fig. 3-1-4

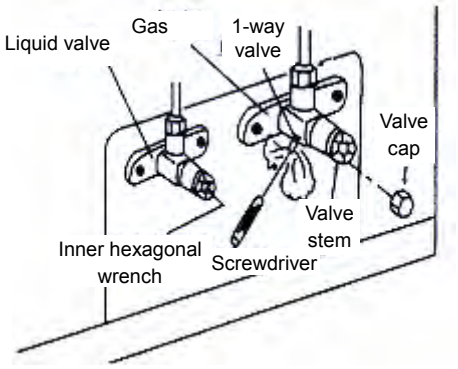


Fig. 3-1-5

Table 3-2

Pipe Dia.	Tightening Torque
1/4 "	15-30 (N • m)
3/8 "	35-40 (N • m)
5/8 "	60-65 (N • m)
1/2 "	45-50 (N • m)
3/4 "	70-75 (N • m)

d) The bend of pipe shall not be too small; otherwise the pipe might be cracked. Please use pipe bender to bend the pipe.

e) The pipe shall be welded by facing the joint upward or horizontally. Avoid facing the pipe opening downward during weld (The downward welding is easy to cause defect and affect quality, or even cause leakage).

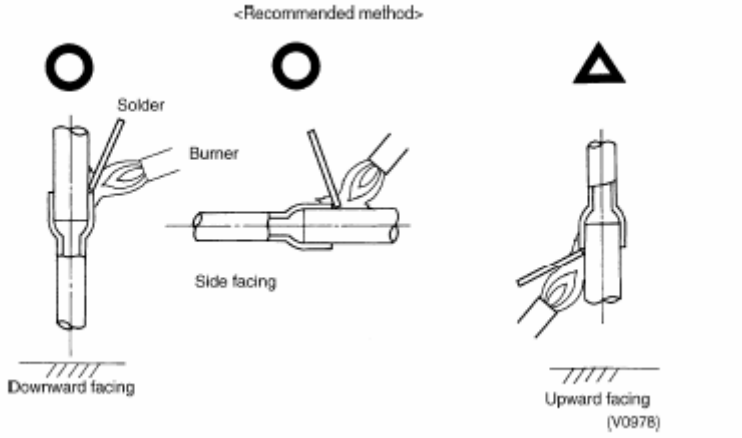


Fig. 3-1-6

f) Use sponge to wrap the connection pipe and connectors and tie with plastic tapes.

2) Vacuum and Leakage Detection

a) Remove the cap on liquid valve and gas valve.

b) Align the center of pipe and adequately tighten the nuts of connection pipe with your hands.

c) Tighten the nuts with wrench.

d) Remove the 1-way valve cap on gas valve.

e) Use inner hexagonal wrench to loosen the element of liquid valve by rotating it for 1/4 turn. Meanwhile, use screwdriver to prop up the element of gas valve until the air is discharged.

f) Discharge the air for 15 seconds until refrigerant occurs. Then, immediately close the 1-way valve and tighten the valve cap.

g) Completely open the element of liquid valve and air valve, (as shown in Fig. 3-1-5).

h) Tighten the valve cap. Then use soap water or leakage detector to check if any air leaks out from the indoor / outdoor unit or pipe connection.

i) If possible, it is best to discharge the air from the valve position by using vacuum pump, as shown in Fig. 3-1-7.

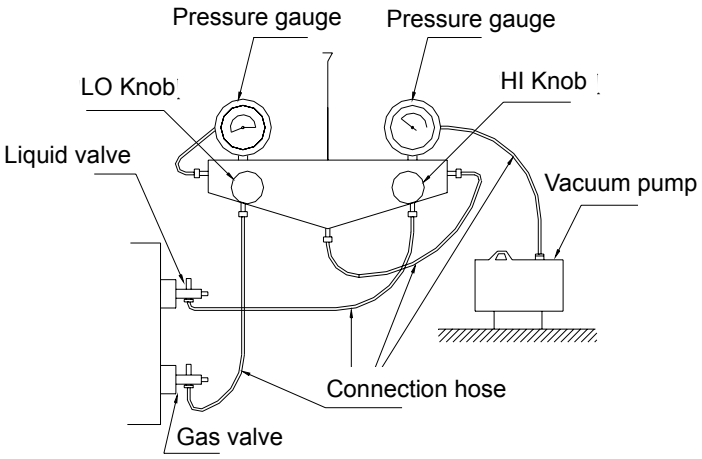


Fig. 3-1-7

3) Installation of Protective Sheath on Connection Pipe

a) To avoid condensing or leakage on connection pipe, the gas pipe and liquid pipe must be insulated from the air by wrapping with hat insulation and adhesive tapes.

b) The connector to indoor unit shall be wrapped by heat insulation materials to ensure no clearance with the wall of indoor unit, as shown in Fig. 3-1-8.

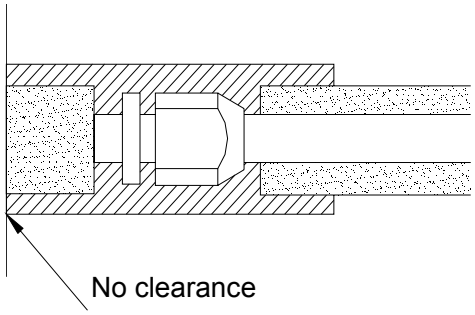


Fig. 3-1-8

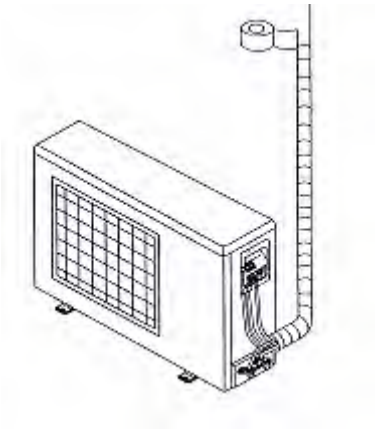


Fig. 3-1-9

c) Use adhesive tape to bundle the connection pipe and cable together. To avoid outflow of condensate water from the drainage pipe, the drainage pipe shall be separated from connection pipe and cable.

d) Wrap heat insulation tape from the bottom of outdoor unit until the upper end of the pipe is deep into the wall. When wrapping the heat insulation tape, please compress each circle to half of the previous circle, as shown in Fig. 3-1-9.

e) Use the pipe clamp to fix the wrapped pipe onto the wall.

Note: 1. After the pipe is properly protected, never bend the pipe to a very small angle; otherwise the pipe might be cracked or broken.

2. Wrapping of the protective tape too tight may reduce the heat insulation effect. Make sure that the condensate drainage pipe is separated from the pipe bundle.

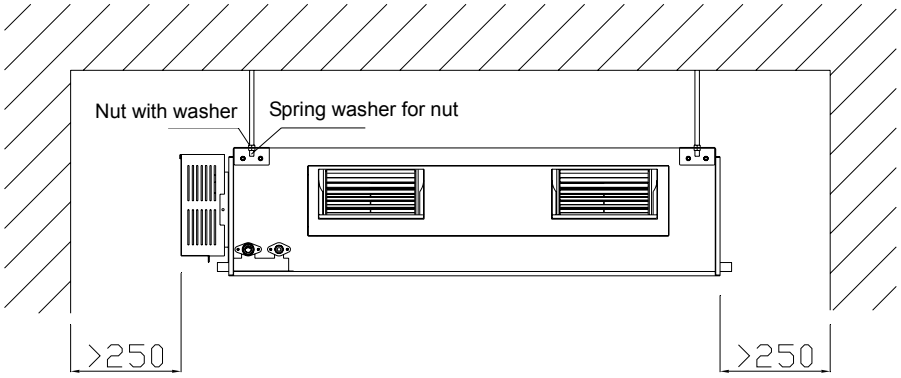
3. After completing the protection work and wrapping the pipe properly, use sealing materials to seal the holes in the wall, thus to prevent rain from invasion into the room.

3.2 Requirements for Installation of Duct Type Indoor Unit

3.2.1 Accessories for installation of duct type indoor unit, as shown below:

Name and Shape	QTY	Description
Operating and Installation Instructions	1	
Heat insulation materials for air connector	1	For gas pipe connector of indoor unit
Heat insulation materials for liquid connector	1	For liquid pipe connector of indoor unit
Heat insulation materials for drainage pipe	2	For condensate water pipe and rubber plug
Nut M8 with washer	8	For fixing the hook
Nut M10 with washer	4	4 sets, for fixing the indoor unit to ceiling
Nut and spring gasket	4	
Hook	4	For fixing the indoor unit to ceiling
String	4 or 8 pcs	4 pcs for 2hp unit and 8 pcs for others
Wired Controller	1	
Remote controller	1	
Battery	2	
Corrugated pipe	0, 2 pcs or 4 pcs	0 for 2hp unit, 2 pcs for 2.5－3hp unit and 4 pcs for 4－5 hp unit
Power cable	1－2 pcs	2 pcs for 4－5 hp unit and 1 pc for others
Connection wires	2－3 pcs	3 pcs for 4－5hp unit and 2 pcs for others

3.2.2 Size of Installation Space



Indoor Unit

Fig. 3-2-1

3.2.3 Installation of Indoor Unit

3.2.3.1 Select the location of installation

1) Ensure that the top hanger frame has enough strength to support the weight of the unit.
2) The drainage pipe shall be easy to drain water.
3) There shall be no obstacle at the inlet and outlet so as to keep the air in good circulation.
4) Ensure the space needed for installation, repair and maintenance works.
5) Select a place far from heat source, flammable gas or smoke.
6) The machine is ceiling mounted (Concealed installed in the ceiling).
7) The indoor unit, outdoor unit, power cord and connection cable shall be kept 1m at least from the TV set or radio. This is to prevent image interference and noise on above appliances.

3.2.3.2 Installation of Air Conditioner Body and Check of Indoor Unit Level

1) Install the expansion bolt

Drill four holes (Dia. 10mm approx.) on the ceiling. Refer to Fig. 3-2-2 for the spacing between the holes. Insert M10 expansion bolt into the hole and then punch the iron nail into the bolt as shown in Fig. 3-2-3.

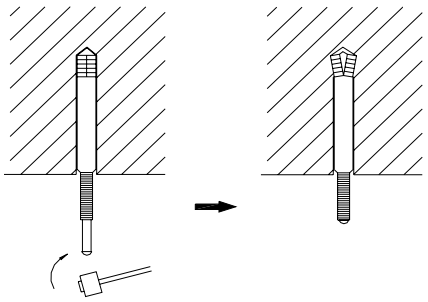


Fig. 3-2-2

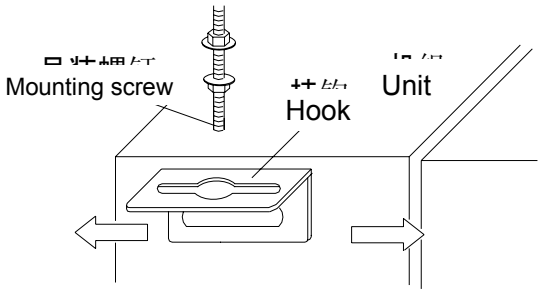


Fig. 3-2-3

2) Install the hook to indoor unit. See Fig. 3-2-4

3) Install indoor unit to the ceiling. See Fig. 3-2-5

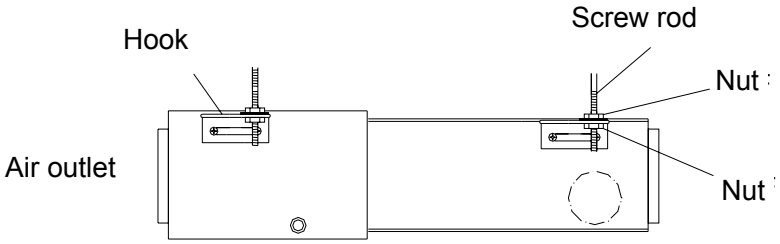


Fig. 3-2-4

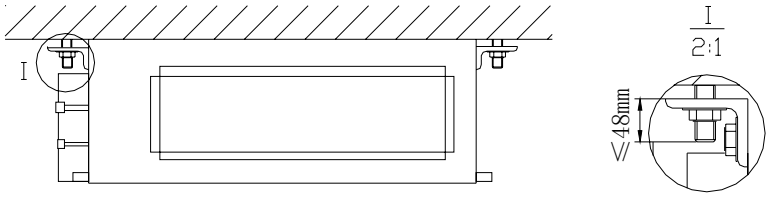


Fig. 3-2-5

4) Check of Indoor Unit Level

After completing the installation of the indoor unit, be sure to check the level of the complete unit so as to make the front, back, left and right of the unit on the same level. See 3-2-6.

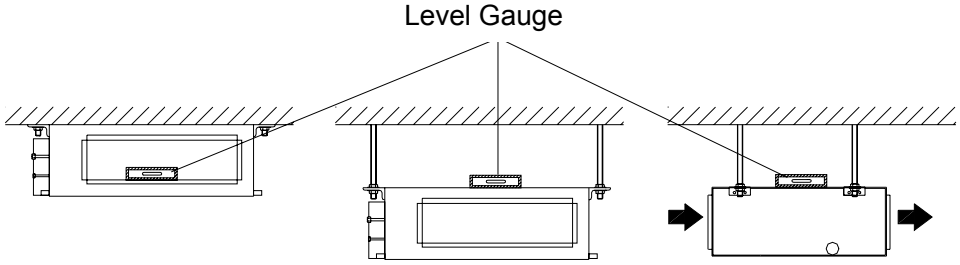


Fig. 3-2-6

3.2.3.3 Installation of Duct

1) Install the rectangular duct. See Fig. 3-2-7

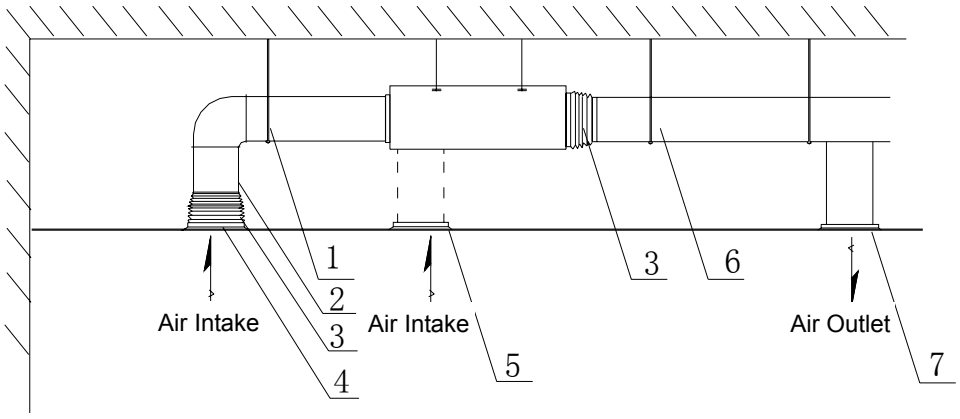
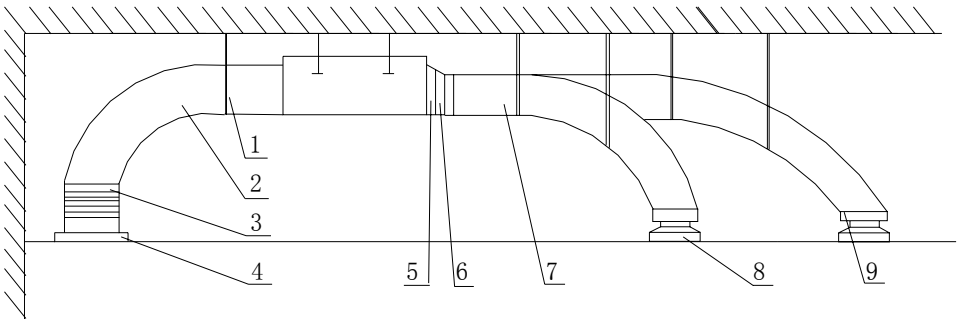


Fig. 3-2-7

S/N	Description	S/N	Description
1	Hanger Bar	5	Filter
2	Intake Pipe	6	Main Outlet Pipe
3	Canvas Duct	7	Air Outlet
4	Air Intake		

2) Install the round duct. See Fig.3-2-8



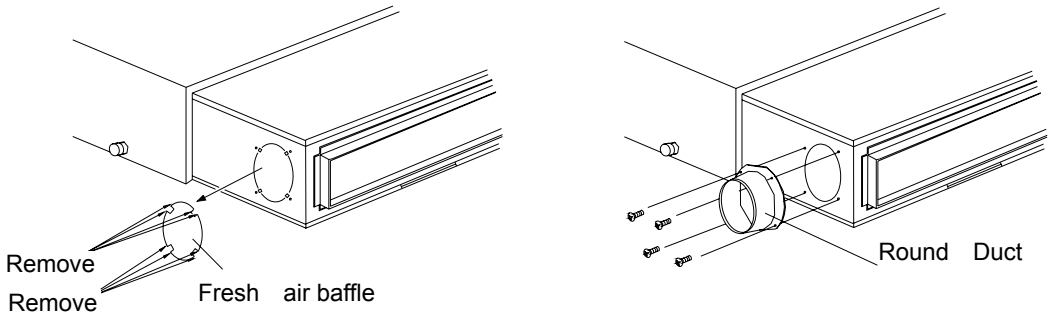
S/N	Description	S/N	Description
1	Hanger Bar	6	Transition Duct
2	Intake Pipe	7	Air Outlet Pipe
3	Canvas Duct	8	Diffuser
4	Intake Louver	9	Diffuser connector
5	Air Outlet		

Fig. 3-2-8

Note: Shown above is the installation of rear air intake. Bottom air intake may be used according to the needs of actual installation. The installation method is similar to that of rear air intake. In all intake pipes, at least one shall be kept open. Round duct may also be adopted and round heat insulation hose may be used to blow the air to each room. Heat insulation shall be provided for both outlet pipe and intake pipe.

3.2.3.4 Installation of Fresh Air Pipe (Limited to extra residual pressure unit with a cooling capacity over 6000W)

1) To connect the fresh air pipe, cut off the fresh air baffle firstly, as shown in Fig. 3-2-9 (a). If fresh air pipe is not required, use sponge to seal the seam on fresh air baffle.
2) Mount a round flange for connection of fresh air pipe. See Fig. 3-2-9 (b).
3) Both the duct and round flange need good sealing and heat insulation.
4) The fresh air shall be filtered air.



(a) (b)

Fig. 3-2 -9

3.2.3.5 Installation of Intake Pipe

1) The square flange is factory mounted at the rear part, while the cover of air intake is mounted at the bottom. See Fig. 3-2-10.

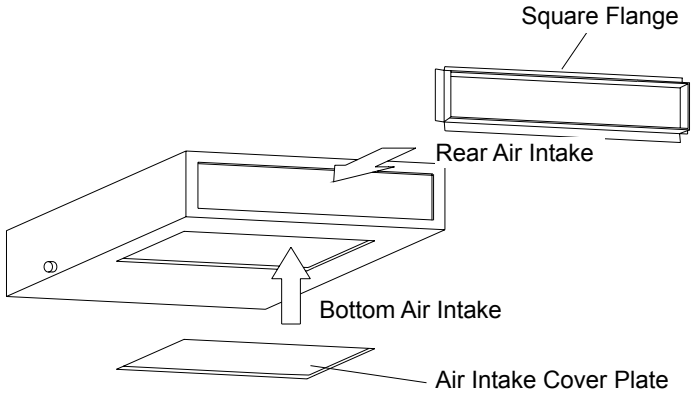
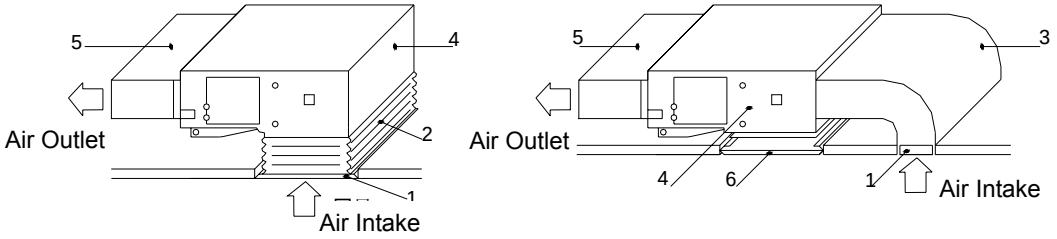


Fig. 3-2-10

2) If bottom air intake is required, just change the position of square flange and air intake cover.

3) Rivet the intake pipe to the air intake of indoor unit and another end to the intake window. For free adjustment of the height, you may fabricate a section of canvas duct and reinforce with 8# iron wires in folded form. The user may select the installation method in unified consideration of the constructions and maintainability. See Fig. 3-2-11.



S/N	Description	S/N	Description
1	Intake Window	4	Indoor Unit
2	Canvas Duct	5	Outlet Pipe
3	Intake Pipe	6	Test Grill

Fig. 3-2-11

3.2.3.6 Installation of Round Outlet Pipe

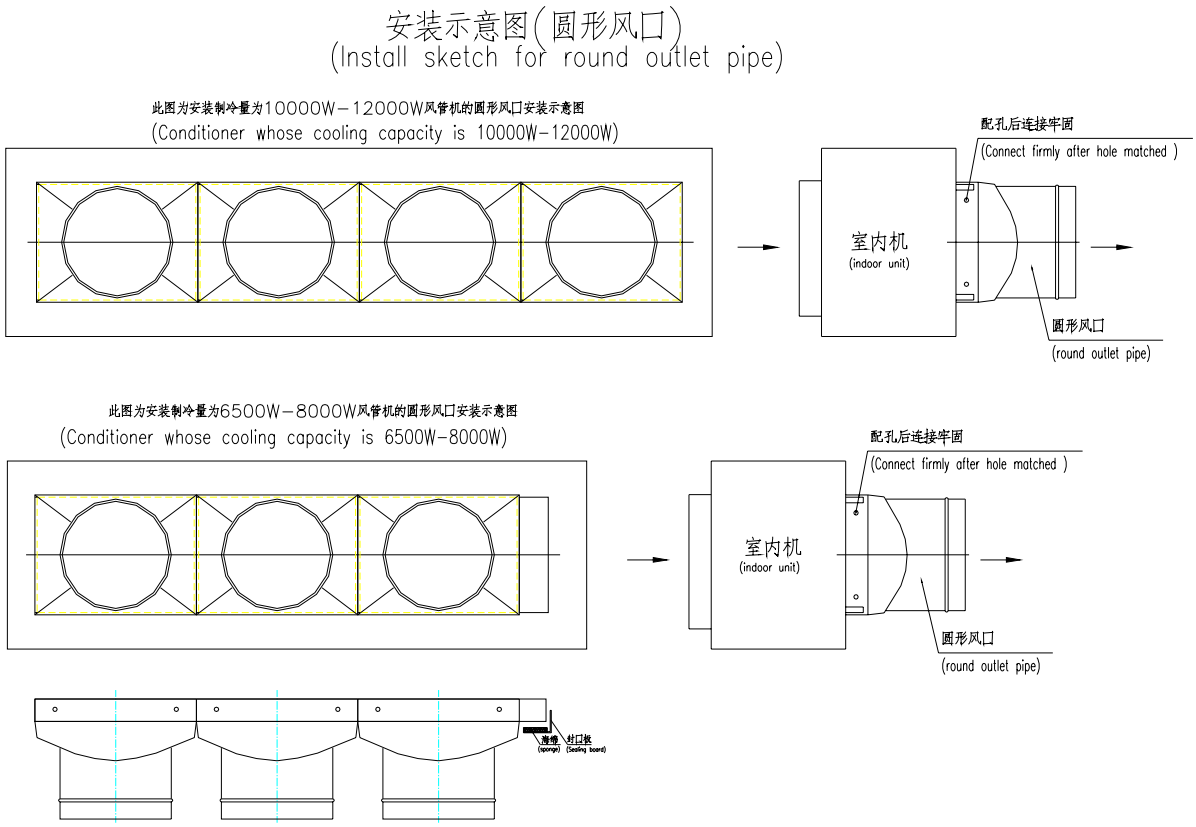
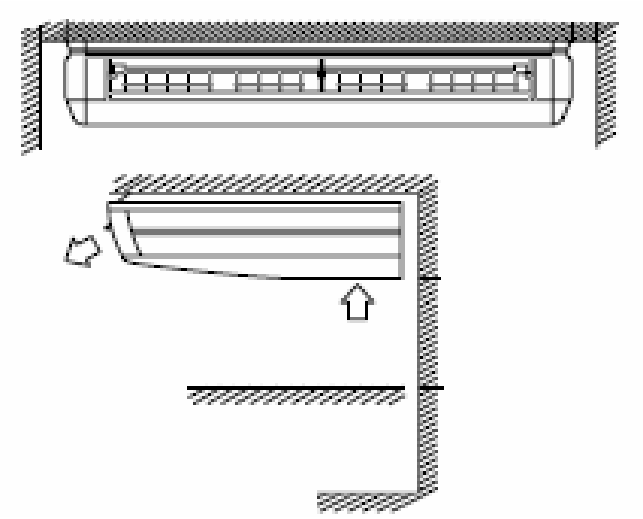
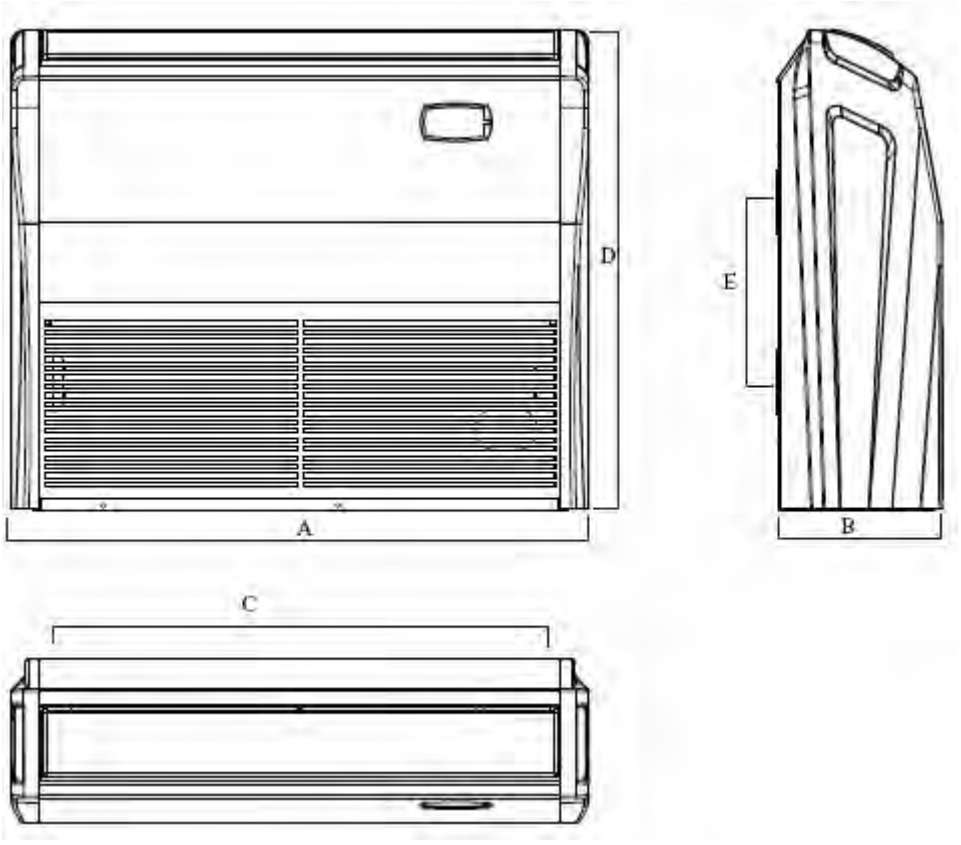


Fig. 3-2-12

3.3 Requirements for Installation of Ceiling-seated Indoor Unit

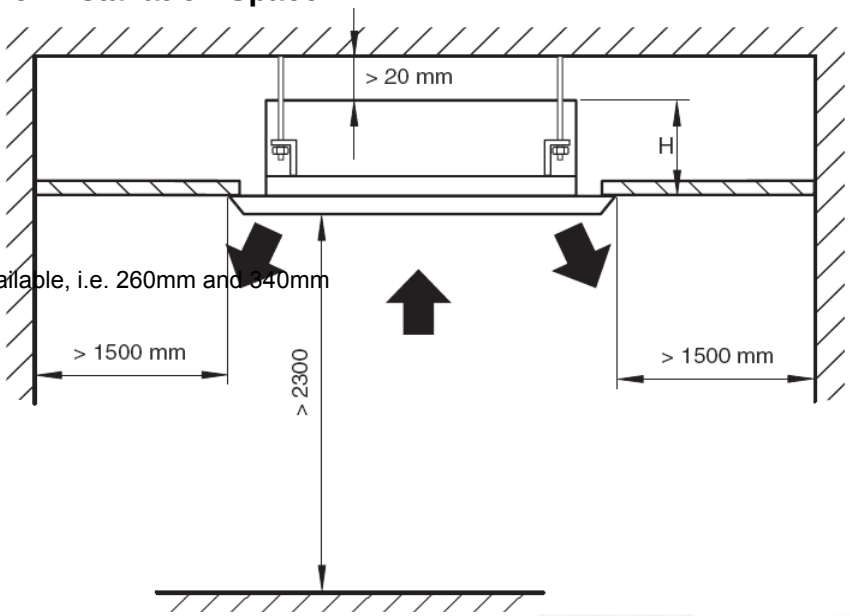
3.3.1 Size of Installation Space



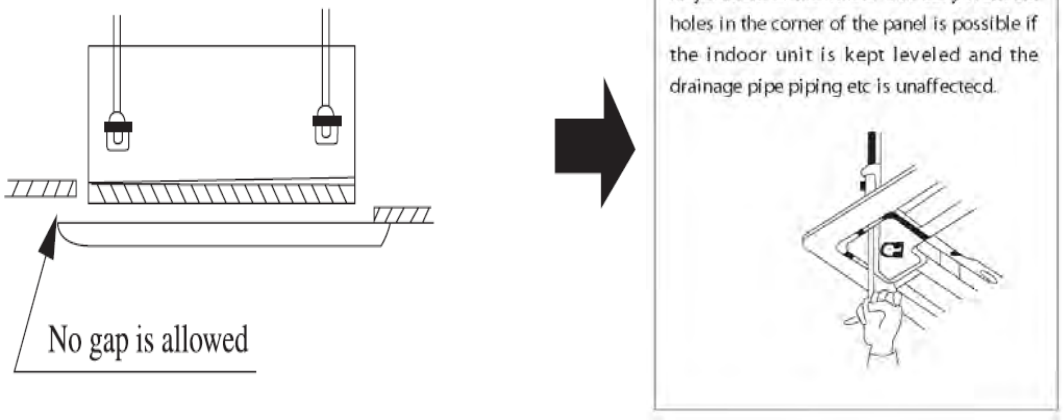


3.4 Requirements for Installation of Well Type Indoor Unit

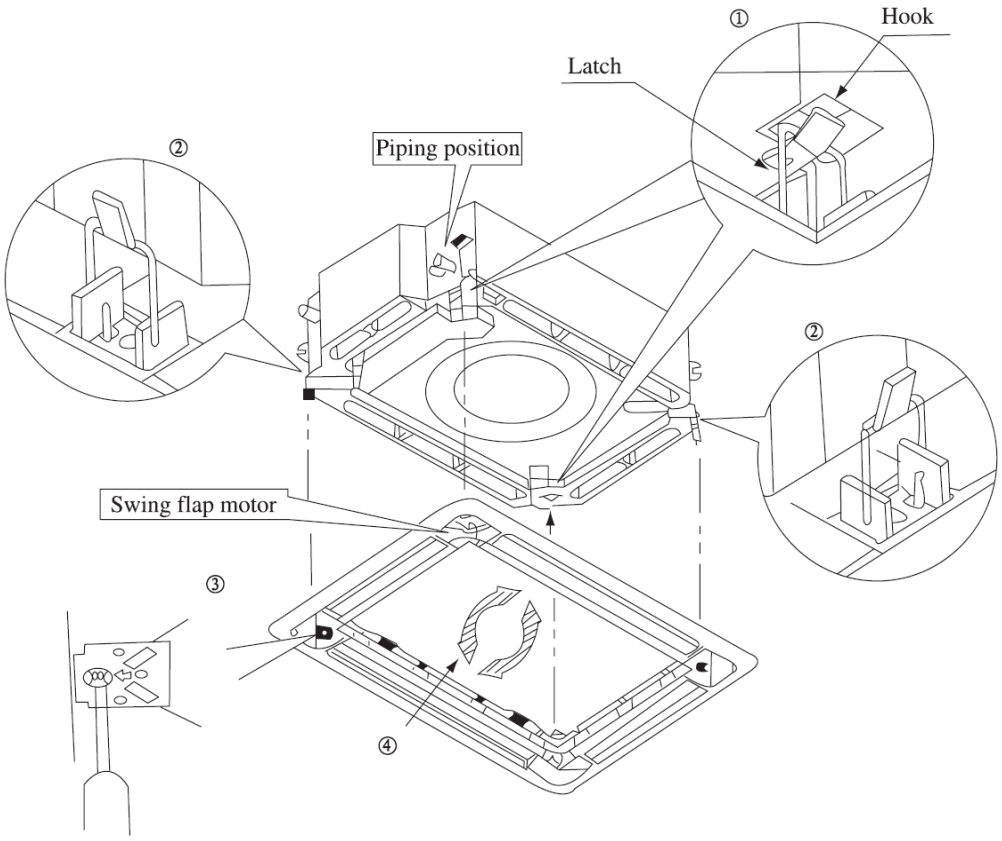
3.4.1 Size of Installation Space

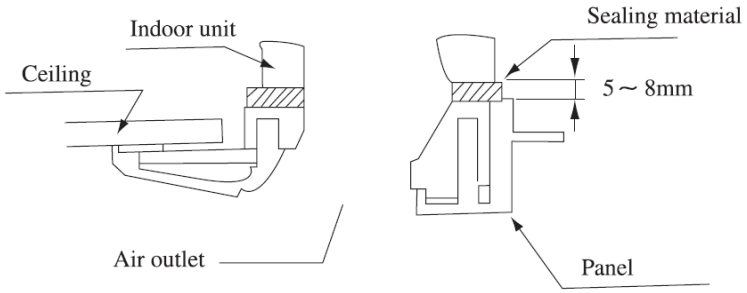


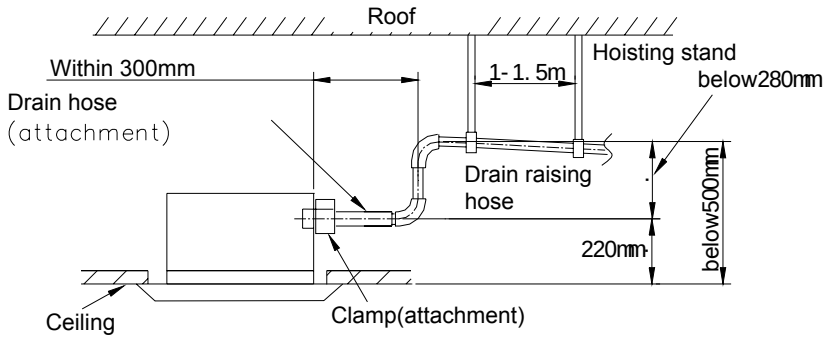
Two heights available, i.e. 260mm and 340mm


No gap is allowed
Adjustment of the indoor unit body from the holes in the corner of the panel is possible if the indoor unit is kept leveled and the drainage pipe piping etc is unaffectecd.

The unit shall be so installed that the front panel must be tightly sealed to the body.







Position and Requirements of Condensate Pipe

3.5 Other Accessories and Auxiliary Requirements

3.5.1 Installation of Condensate Pipe

1) The condensate pipe shall be kept an inclination 5~10° for easier drain of the condensate water. To prevent condensed dew, the connector of condensate pipe shall be heat insulated. (See Fig. 3-5-1)
2) One condensate outlet is provided on the left and right side of the indoor unit respectively. After the condensate outlet is determined, please use rubber plug to block the outlet on another side and fix with tie strap to prevent leakage. Wrap properly with heat insulation materials.
3) The right condensate outlet is factory blocked by rubber plug.

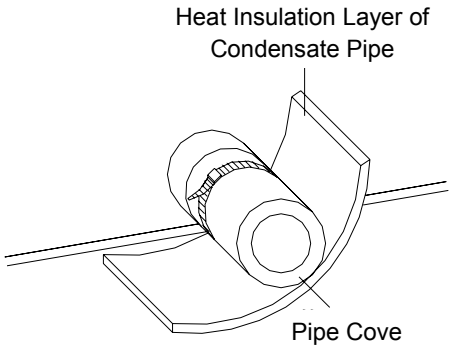


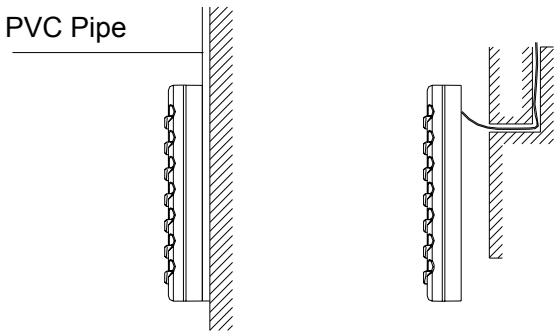
Fig. 3-5-1

3.5.2 Installation and Connection of Wired Controller

1) Firstly, select the installing location. According to the size of communication wire for Wired Controller, reserve a groove or cable hole for embedding of communication wire.
2) For open installation of the communication wire between Wired Controller (85 X 85 X16) and indoor unit, you may use 1# PVC pipe and set up an appropriate groove in the wall (See Fig. 3-5-2(a)). For concealed installation, you may use 1＃PVC pipe (See Fig. 3-5-2(b)).
3) Fig. 3-5-3 shall be followed no matter for open installation or for concealed installation. Firstly, refer to the spacing of mounting holes (60mm) on the base panel of Wired Controller and drill 2 holes (kept level) in the wall. Then, knock a wood plug into each hole and fix the base panel of Wired Controller onto the wall. After that, insert the communication wire into the control board. Finally, cover up the front panel of Wired Controller.

Note:

When installing the base panel of Wired Controller, take special care on the direction of base panel. The side with 2 notches must face downward; otherwise it will be impossible to mount the Wired Controller panel correctly.



(a) Open Installation of Cable (b) Concealed Installation of Cable

Fig. 3-5-2

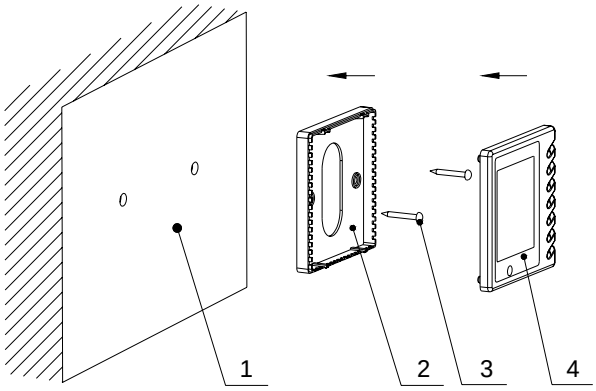


Fig. 3-5-3 Installation Sketch

S/N	Description
1	Wall
2	Base Panel of Wired Controller
3	Screw M4X10
4	Front Panel of Wired Controller

3.5.3 Connection of Electric Wire to Terminal Board See Fig. 3-5-4。

1) Before installing the electrical equipment, please take care on the following:

a) Check if the power supply is identical to the ratings on nameplate.

b) The power capacity shall be high enough and the section area of the cables in the room shall be over 2.5mm^2.

c) The cable must be installed by professional technicians.

d) The permanent circuit must be installed with leakage protection switch and air switch with electrode contacts spaced over 3mm.

2) Connect the single wire

a) Use a wire stripper to remove the insulation layer for about 25mm at the end of the single wire.

b) Remove the screws from the terminal board of air conditioner.

c) Use pliers to bend the end of single wire to a round ring conforming to the screw size.

d) Insert the screw through the round ring of single wire and fix onto the terminal board.

3) Connect the stranded wire

a) Use a wire stripper to remove the insulation layer for about 10mm at the end of the stranded wire.

b) Remove the screws from the terminal board of air conditioner.

c) Use crimping pliers to clamp the end of stranded wire and make a terminal conforming to the screw size.

d) Insert the screw through the terminal of stranded wire and fix onto the terminal board.

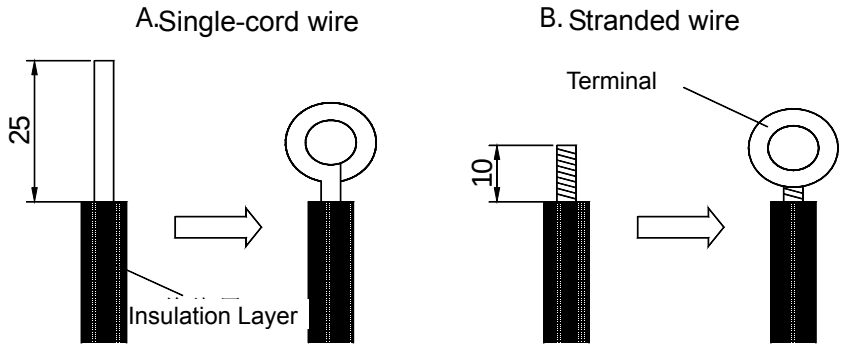


Fig. 3-5-4

Notes:

a) If the power cord or signal wire is damaged, be sure to replace with special cord.

b) Please identify the voltage indicated on the nameplate before starting cable connection according to the wiring diagram.

c) The air conditioner shall be provided with special power cable and equipped with leakage switch and air switch to respond to any overloading.

d) The air conditioner must be properly earthed to avoid the harm caused by insulation failure.

e) All wires must be connected via press terminal or single wire. Direct connection of stranded wire to the terminal board may cause spark.

f) All cables shall be correctly connected in accordance with the wiring diagram. Wrong connection may cause malfunction or damage to the air conditioner.

g) Prevent the cables from contacting the refrigerant pipe, compressor, fan or other moving parts.

h) Do not change the cable connection inside the air conditioner. The manufacturer is not liable for any loss or abnormal operation thus arising.

3.5.4 Connection of Power Cable

1) For air conditioner using 1-phase supply:
   a) Remove the front side plate of outdoor unit.
   b) Open the cable-cross hole of outdoor unit and mount a rubber ring.
   c) Insert the cable through rubber ring.
   d) Connect the power cable to “L”, “N” terminals and earth screw.
   e) Fix the cable with tie strap.
2) For air conditioner using 3-phase supply:
   a) Remove the front side plate of outdoor unit.
   b) Open the cable-cross hole of outdoor unit and mount a rubber ring.
   c) Insert the cable through rubber ring.
   d) Connect the power cable to “L1”, “L2”, “L3”, “N” terminals and earth screw.
   e) Fix the cable securely with cable clamp.

Notes: For the air conditioner with auxiliary electric heater, the power cable shall also be connected to “L1” , “L2”, “L3”, “N” terminals and earth screw in the electric box of indoor unit.

3.5.5 Connection of Wired Controller Signal Wire

1) Open the electric box of indoor unit.
2) Insert the Wired Controller signal wire through the rubber ring.
3) Insert the Wired Controller signal wire into the 4-bit seat.
4) Fix the signal wire of Wired Controller tightly with tie strap.

Notes:

a) To prevent the air conditioner from malfunction due to electromagnetic interference, be sure to take special care when performing the cable connection below.
b) The signal wire of Wired Controller shall be separated from power cable and indoor/outdoor connection cable.
c) If the air conditioner is installed at a place subject to electromagnetic interference, it is best to use the shield wire and twisted pair as the signal wire of Wired Controller.

3.5.6 Cable Connection

1) Remove the right side plate of outdoor unit and open the cable-cross hole. Install the cable-cross loop.
2) Remove the cable clamp. Connect the power cable to the terminals and fix.
3) Use wire clamp to fix the power cable and signal control wire. Then, connect correctly.
4) Check if the cable is properly fixed.
5) Reinstall the front side plate.

3.5.7 Drainage of Outdoor Condensate Water (No for cooling-only unit)

When the air conditioner is working under HEAT mode, the condensate water generated by the outdoor unit and the defrosting water during defrosting mode operation will be drained to a proper place via drainage pipe.

How to Install: Clamp the outdoor drainage connector to ϕ25 hole on the base, as shown in Fig. 3-5-5. Then, connect the drainage pipe to drainage nozzle, so that the condensate water and defrosting water can be drained to an appropriate place.

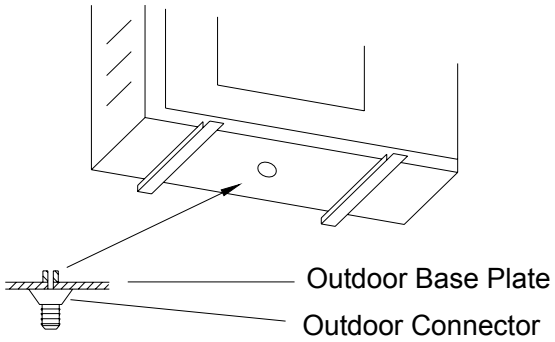


Fig. 3-5-5

3.5.8 Precautions on Installation

1. Follow the illustrated requirements to ensure there is enough space and good ventilation for operation, repair and maintenance of the unit.
2. Drainage ditch shall be provided on the ground of outdoor unit.
3. To meet the restrictions of noise and vibration, the outdoor unit shall be installed with rubber damping cushion, spring damper or rubber connector.
4. The beam and frame to lift the indoor unit shall be able to support 4 times the weight. The bolts, caps and other fasteners shall be subjected to antirust treatment. Soft connector shall be added at the connection of duct, thus to reduce the vibration.
5. The duct shall be designed in reference to data provided in the data sheet and the computation method described in Part 1 of this manual. Heat insulation and sound insulation shall be provided. It is recommended to use air flow regulation valve to adjust the air flow at different positions of the air outlet system, making the unit run under optimum state.
6. Be sure to lift the indoor and outdoor unit by using the designated lifting holes. During lift, take care to protect the unit and avoid knocking the plates, thus to prevent possible

rusting in the future.

7. SINCLAIR will not provide the copper tube, power cable and signal wire. Please prepare according to technical parameters, and connect the pipe, power supply and circuits correctly.
8. The unit must be tested by professional technicians or the user's people with air conditioner knowledge under the instructions of SINCLAIRS's professional technicians.
9. Before installing the indoor and outdoor connecting pipe, do not remove the plug sealing the pipe.
10. To prevent dust or moisture entering into the system, connect the pipe quickly after removing the seal plug.
11. The pipe must be installed in a wall-cross tube when passing the wall.
12. The shorter the connecting pipe is, the better. The smaller the height difference between indoor unit and outdoor unit is, the better. The fewer the pipe bends, the better. The bending radius shall be as large as possible.
13. When laying the pipes along the designated route, do not flatten the pipe. The bending radius must be over 200MM. The connecting pipe shall not frequently bent or stretched; otherwise it will become hardened. One pipe shall not be bent at the same position over 3 times the maximum.

3.5.9 Precautions on Installation of Indoor Condensate Pipe

It is usually found that the condensate water of duct type air conditioner cannot be drained out. Through our investigation and analysis, it is because the relative high-speed air flow generated under negative pressure inside the unit that disturbs the normal drain of condensate water. Therefore, we need to install a section of water seal at the drainage outlet.

As shown in Fig. 3-5-6, the height of water seal depends on the pressure inside the section where the condensate pipe is located.

When the section of condensate pipe is under negative pressure, $h=x \geqslant \frac{P}{10}+20(mm)$

When the section of condensate pipe is under positive pressure, $x \geqslant 30mm$，$h \geqslant \frac{P}{10}+20(mm)$

In which: P – Absolute pressure of this section inside the equipment, Pa。

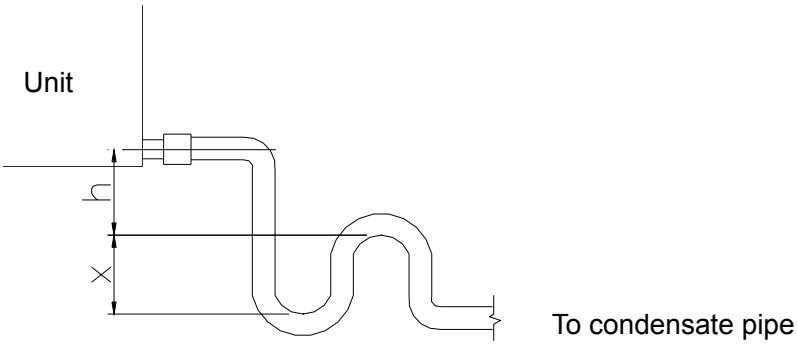


Fig. 3-5-6 Indoor Water Seal Sketch

Note: 1. “h” shall be less than 50mm the minimum.

2. The condensate pipe shall be heat insulated.

3. The condensate pipe shall be kept an inclination 5～10° for easier drain of the condensate water. To avoid condensing dew, the connector of condensate pipe shall be heat insulated.

4. Please test the drainage system after completing the installation works. During test, check if the water flows through the pipe correctly. Check the connecting point with care to ensure there is no leakage. If the unit is installed in a new house, it is recommended to test before starting decoration of the ceiling.

3.5.10 Trial Run and Checks after Installation

Trial Run

1) Preparations for Trial Run

a) Do not connect to the power supply unless all installation works has been completed.

b) The control circuit is correctly connected and all cables are fixed securely.

c) The valve of gas pipe and liquid pipe shall be open.

d) All scattered articles, especially the metal scraps and threads, shall be removed from the unit.

2) Method of Trial Run

a) Switch on the power and press the ON/OFF button on the remote controller to start the test run.

b) Press MODE button and select COOL, HEAT and FAN mode to check if the run is normal.

c) Emergency run.

Checks after Installation See Table 3-4

Table 3-4

Items to be Checked	Possible Result in Case of Improper Installation
If the installation is secure?	The unit may fall, vibrate or give out noise
If the leakage detection is done?	Possibly causing low cooling capacity (heating capacity).
If the unit is heat insulated satisfactorily?	Possible dew or drips of water
If the water drainage is smooth?	Possible dew or drips of water
If the power voltage is identical to the ratings on nameplate?	The machine may be incurred to failure or the parts may be burnt
If the cables and pipes are connected correctly?	The machine may be incurred to failure or the parts may be burnt
If the unit is safely earthed?	Risk of electric leakage
If the cable type conforms to the specification?	The machine may be incurred to failure or the parts may be burnt
If there is obstacles at the air inlet and outlet of indoor and outdoor unit?	Possibly causing low cooling capacity (heating capacity).
If the refrigerant pipe length and refrigerant fill are recorded?	Unable to control the quantity of refrigerant filled

3.6 Electric Installation

Working environment of electrical devices:

☆Be sure the electric supply that user applies is beyond the bounds of tolerances (+/-10%, +/-1Hz).

☆The ambient temperature should be at 5-40°C ,and the humidity be at 30-95% .

☆Transport/storage temperature should be at -25-55°C and for short period not exceeding 24h at up to +70°C.

☆ The installation altitude beyond the hight of 1000m.

Cautions on Electric Installation:

Caution: Before installing the electrical equipment, please pay attention to the following matters which have been specially pointed out by our designers:

（1） Check to see if the power supply used conforms to the rated power supply specified on the nameplate.

（2） The capacity of the power supply must be large enough. The section area of fitting line in the room shall be larger than 2.5mm^2.

（3） The lines must be installed by professional personnel.

An electricity leakage protection switch and an air switch with gap between electrode heads larger than 3 mm shall be installed in the fixed line.

1. Connection of single wire

（2） Use wire stripper to strip the insulation layer (25mm long) from the end of the

single wire.

（3） Remove the screw at the terminal board of the air-conditioning unit.

（4） User pliers to bend the end of the single wire so that a loop matching the screw size is formed.

（5） Put the screw through the loop of the single wire and fix the loop at the terminal board.

2.Connection of multiple twisted wires

（1） Use wire stripper to strip the insulation layer (10mm long) from the end of the multiple twisted wires.

（2） Remove the screw at the terminal board of the air-conditioning unit.

（3） Use crimping pliers to connect a terminal (matching the size of the screw) at the end of the multiple twisted wires.

（4） Put the screw through the terminal of the multiple twisted wires and fix the terminal at the terminal board.

⚠ **Warning:**

If the power supply flexible line or the signal line of the equipment is damaged, only use special flexible line to replace it.

1. Before connecting lines, read the voltages of the relevant parts on the nameplate. Then carry out line connection according to the schematic diagram.
2. The air-conditioning unit shall have special power supply line which shall be equipped with electricity leakage switch and air switch, so as to deal with overload conditions.
3. The air-conditioning unit must have grounding to avoid hazard owing to insulation failure.
4. All fitting lines must use crimp terminals or single wire. If multiple twisted wires are connected to terminal board, arc may arise.
5. All line connections must conform to the schematic diagram of lines. Wrong connection may cause abnormal operation or damage of the air-conditioning unit.
6. Do not let any cable contact the refrigerant pipe, the compressor and moving parts such as fan.
   Do not change the internal line connections inside the air-conditioning unit. The manufacturer shall not be liable for any loss or abnormal operation arising from wrong line connections.
7. shall not be liable for any loss or abnormal operation arising from wrong line connections.

H.Power Cord Connection

1. Air-conditioning unit with single-phase power supply

(1) Remove the front-side panel of the outdoor unit.

(2) Pass the cable though rubber ring.

⚠ **Caution:**

For air-conditioner with auxiliary heater, it is required to connect the power cable to the “L1, L2 L3 “ terminals and the grounding screw.

(3) Connect the power supply cable to the “L, N” terminals and the grounding screw.

(4) Use cable fastener to bundle and fix the cable.

2. Air-conditioning unit with 3-phase power supply

(1) Remove the front-side panel of the outdoor unit.

(2) Attach rubber ring to the cable-cross hole of the outdoor unit.

(3) Pass the cable though rubber ring.

(4) Connect the power cable to the terminal and earthing screws marked “L1, L2, L3 & N”.

(5) Use cable fastener to bundle and fix the cable.

I.Connection of Signal Line of Wire Controller

1. Open the cover of the electric box of the indoor unit.

2. Pull the signal cable of the wire controller through the rubber ring.

3. Plug the signal line of the wire controller onto the 4-bit pin socket at the circuit board of the indoor unit.

4. Use cable fastener to bundle and fix the signal cable of the wire controller.

⚠ Caution:

Take great care when carrying out the following connections, so as to avoid malfunction of the air-conditioning unit because of electromagnetic interference.

(1) The signal line of the wire controller must be separated from the power line and the connecting line between the indoor unit and the outdoor unit.

(2) In case the unit is installed in a place vulnerable by electromagnetic interference, it is better to use shielded cable or double-twisted cable as the signal line of the wire controller.

● Products Electric Installation

! Caution

The unit should be reliably earthed, if it is improperly earthed that may cause electric shock or fire.

Wiring layout

 Installation should be conducted by National Wiring Regulation.

 The rated voltage and exclusive power supply must be adopted for the air conditioners.

 The power cable should be reliable and fixed, in order to avoid the wiring terminal be suffered from force. And do not drag the power cable forcibly.

 The wire diameter of power cable should be large enough, if power cable and connection wire be damaged, it should be replaced by the exclusive cable.

 All electric installation must be done by professional personnel according to local law, regulation and this manual.

 It should be reliably earthed, and it should be connected to the special earth device, the installation work should be operated by the professional.

 The creepage protect switch and air switch must be installed.

Air switch should have the thermal dropout and magnetic dropout function, in order to avoid the short circuit and overload.

 The on spot connection should refer to the circuit diagram, which is stuck on the unit body.

Below is the recommended air switch capacity for related power cable diameters (For the diameter of power cables for each unit, please see the attached instruction manual).

Dia. Of Power Cable	Air Switch Capacity (A)	Dia. Of Power Cable	Air Switch Capacity (A)
2.5mm^2	16A	4 mm^2	20A
6 mm^2	25A;32A	10 mm^2	40A
16 mm^2	50A	25mm^2	63A

Condition for model selection above: The specification of power cable refers to the specification of the BV single-cord cable (2 – 4 pcs) is paved in plastic pipe and used under an ambient temperature of 40°C. The air switch is used under 40°C and the type of air switch is “D”. In case of any change in the actual installation conditions on site, please follow the specifications of power cables and air switch provided by the manufacturer and use for reduced capacity.

● **Requirement for ground**

☆ Air conditioner is the I class electric appliance, thus please do conduct reliable grounding measure.

☆ The yellow-green two-color wiring of air conditioner is grounding wire and can not be used for other purposes. It cannot be cut off and be fixed by screw, otherwise it would cause electric shock.

☆ The user must offer the reliable grounding terminal. Please don’t connect the grounding wire

to the following places:

① Water pipe；

② Gas pipe；

③ Blowing pipe；

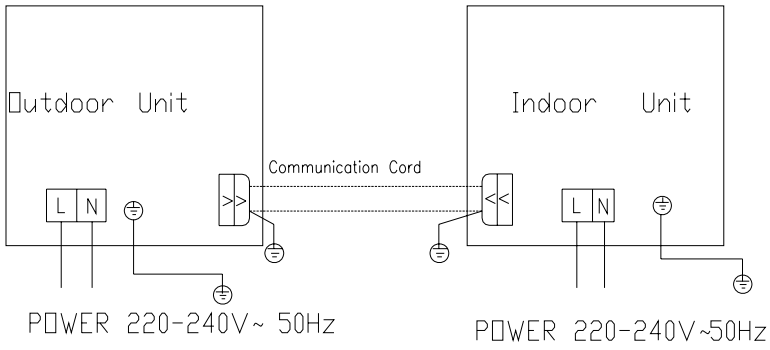
④ Other places that professional personnel consider them unreliable.

Power Supply to Indoor and Outdoor Unit:

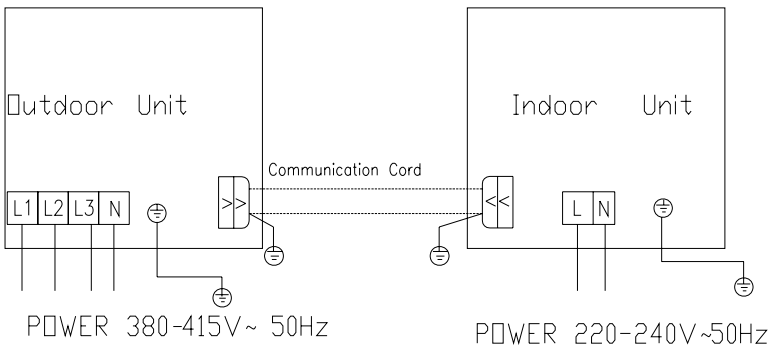
The power cable, communication wire connection between indoor and outdoor

The power distribution for complete unit is as follows. The actual connection of earthing wires shall be based on the circuit diagram attached on each unit.

Single-phase Outdoor Unit:



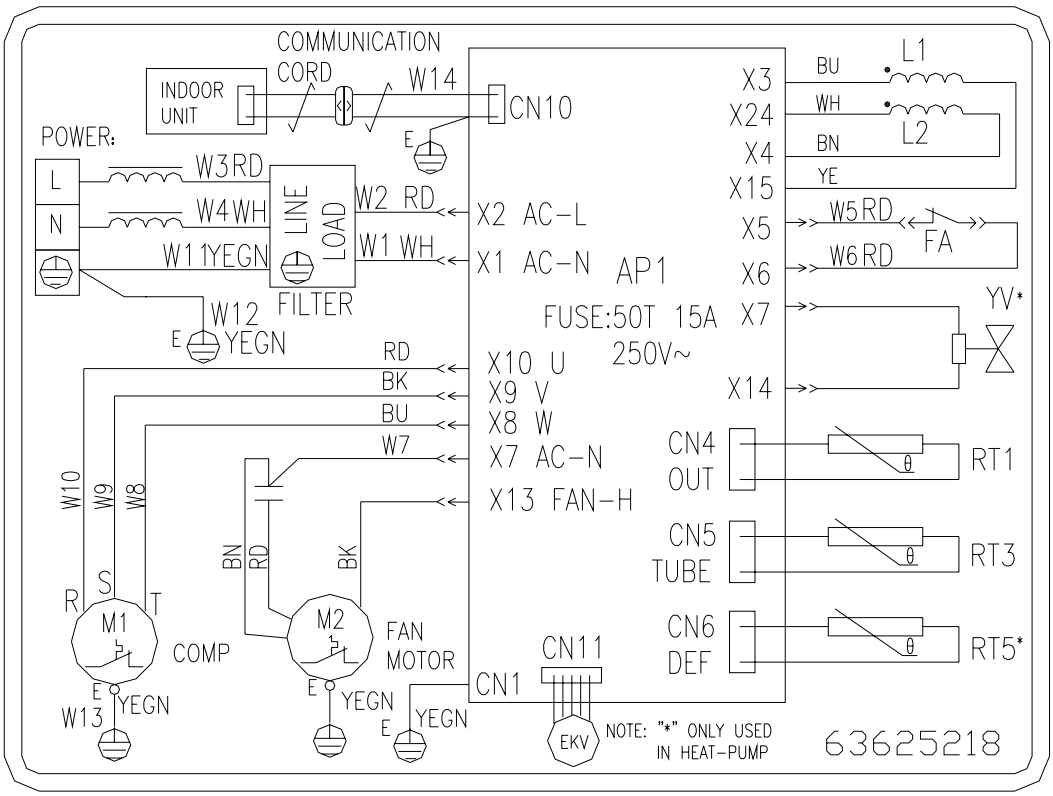
Three-phase Outdoor Unit: 5



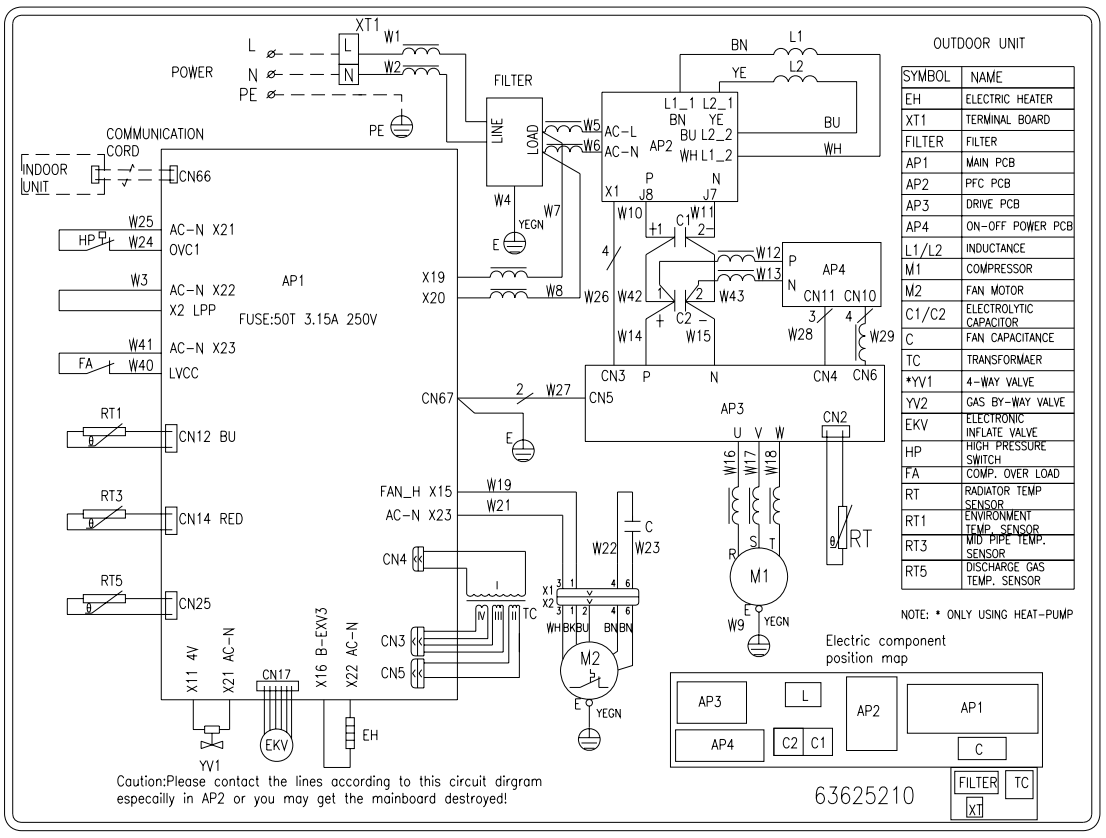
Circuit Diagram:

Outdoor Unit:

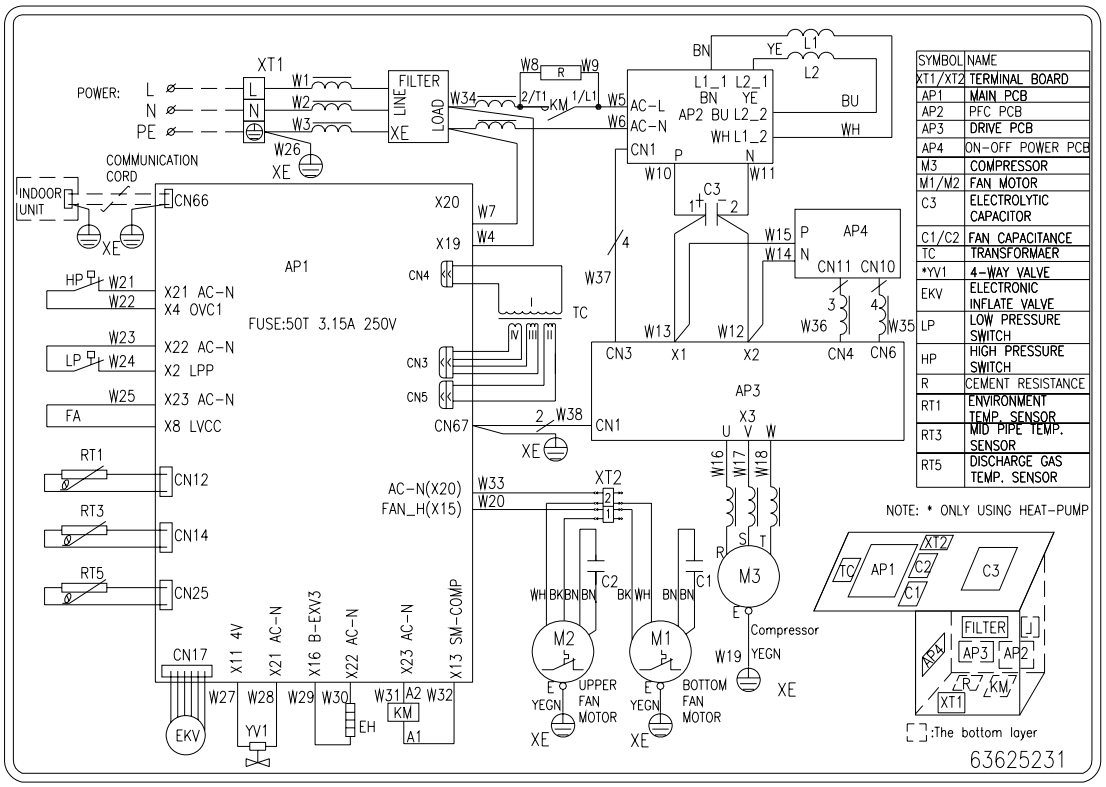
ASGE-18AI (Compatible with 18 Ceiling-seated and Duct Type Unit and 18 Well Type Unit):



ASGE-24AI (Compatible with 24 Ceiling-seated and Duct Type Unit and Well Type Unit):

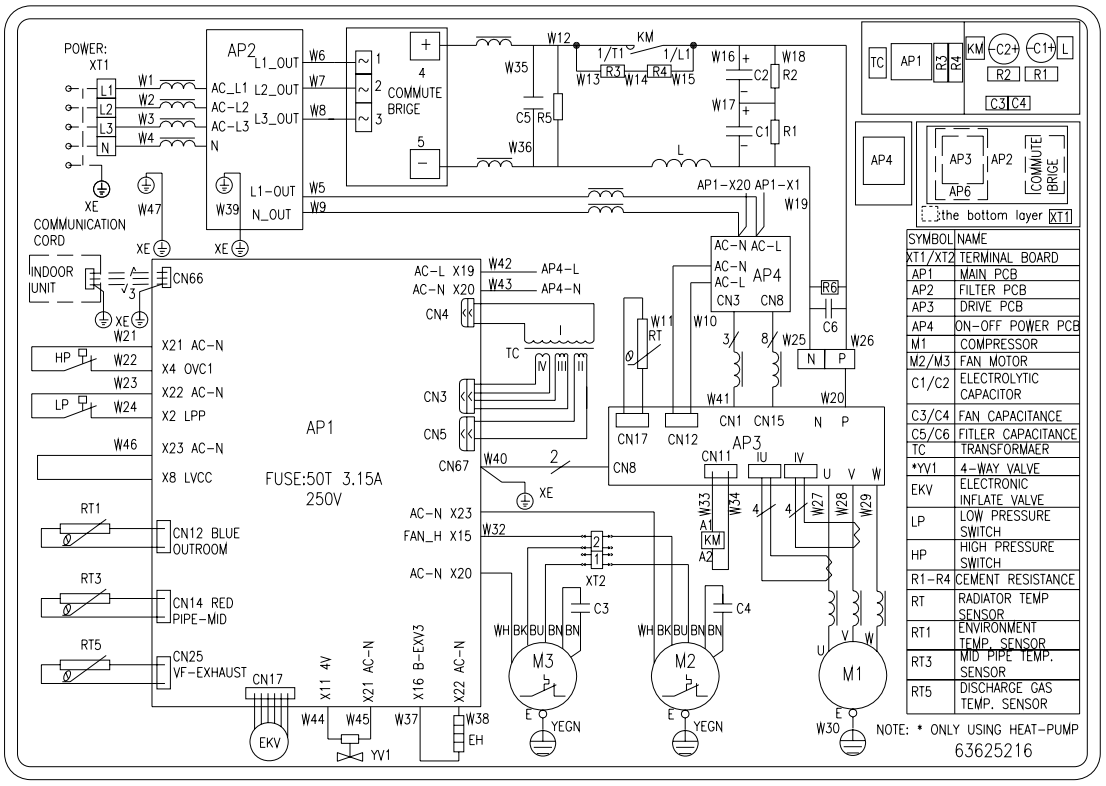


ASGE-36AI (Compatible with 36 Ceiling-seated and Duct Type Unit and Well Type Unit):



SYMBOL	NAME
XT1/XT2	TERMINAL BOARD
AP1	MAIN PCB
AP2	PFC PCB
AP3	DRIVE PCB
AP4	ON-OFF POWER PCB
M3	COMPRESSOR
M1/M2	FAN MOTOR
C3	ELECTROLYTIC CAPACITOR
C1/C2	FAN CAPACITANCE
TC	TRANSFORMAER
*YV1	4-WAY VALVE
EKV	ELECTRONIC INFLATE VALVE
LP	LOW PRESSURE SWITCH
HP	HIGH PRESSURE SWITCH
R	CEMENT RESISTANCE
RT1	ENVIRONMENT TEMP. SENSOR
RT3	MID PIPE TEMP. SENSOR
RT5	DISCHARGE GAS TEMP. SENSOR

ASGE-36AI-3, ASGE-42AI-3 (Compatible with 36 and 42 Ceiling-seated and Duct Type Unit and Well Type Unit):

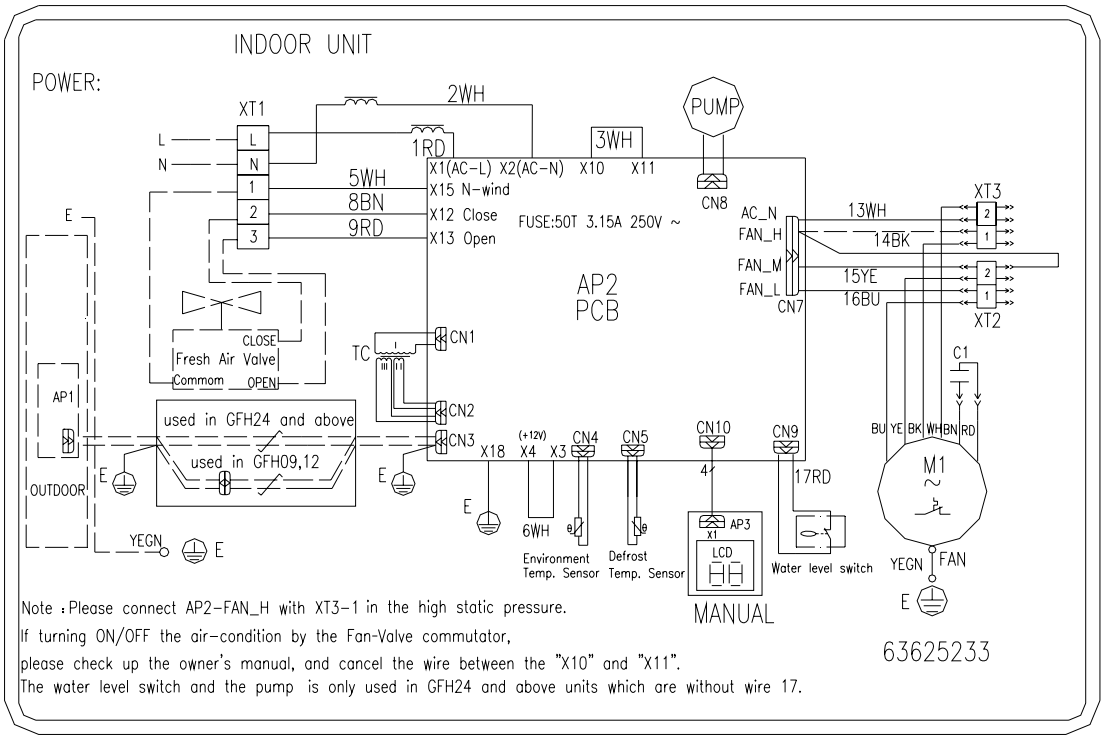


SYMBOL	NAME
XT1/XT2	TERMINAL BOARD
AP1	MAIN PCB
AP2	FILTER PCB
AP3	DRIVE PCB
AP4	ON-OFF POWER PCB
M1	COMPRESSOR
M2/M3	FAN MOTOR
C1/C2	ELECTROLYTIC CAPACITOR
C3/C4	FAN CAPACITANCE
C5/C6	FITLER CAPACITANCE
TC	TRANSFORMAER
*YV1	4-WAY VALVE
EKV	ELECTRONIC INFLATE VALVE
LP	LOW PRESSURE SWITCH
HP	HIGH PRESSURE SWITCH
R1-R4	CEMENT RESISTANCE
RT	RADIATOR TEMP SENSOR
RT1	ENVIRONMENT TEMP. SENSOR
RT3	MID PIPE TEMP. SENSOR
RT5	DISCHARGE GAS TEMP. SENSOR

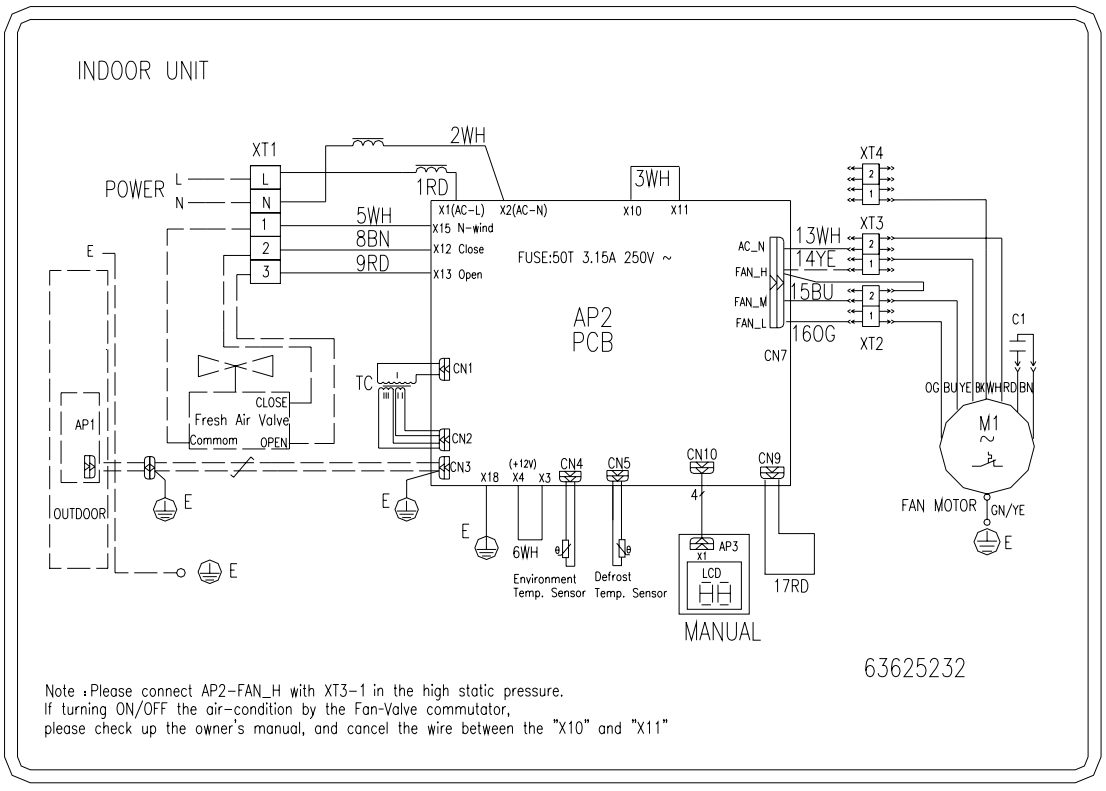
Indoor Unit:

Duct Type Indoor Unit:

ASD-24AI, ASD-36AI, ASD-36AI-3, ASD-42AI-3:

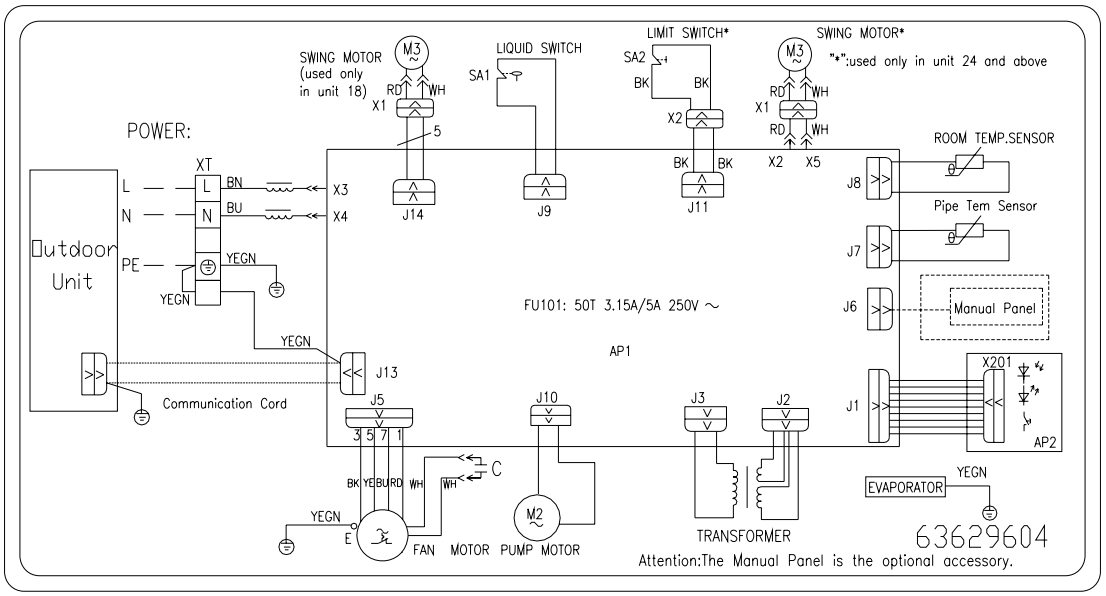


ASD-18AI:



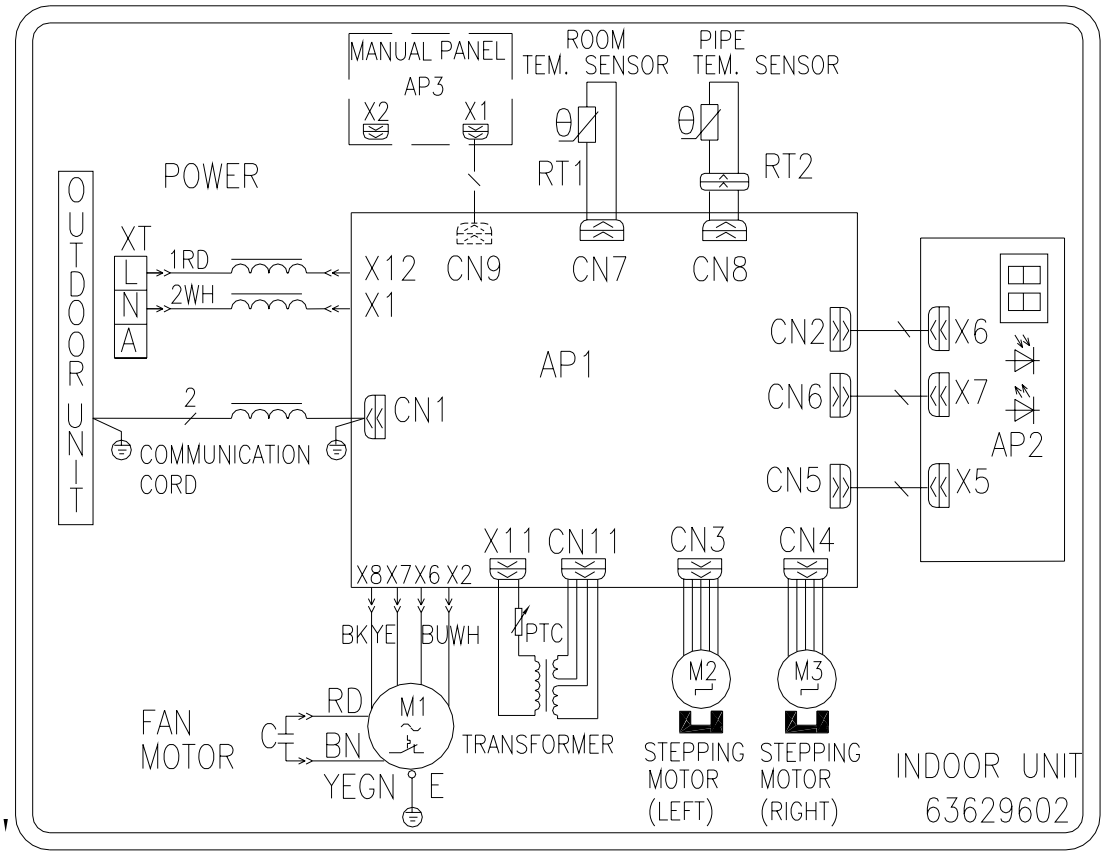
Well Type Indoor Unit:

ASC-18AI～ASC-42AI：



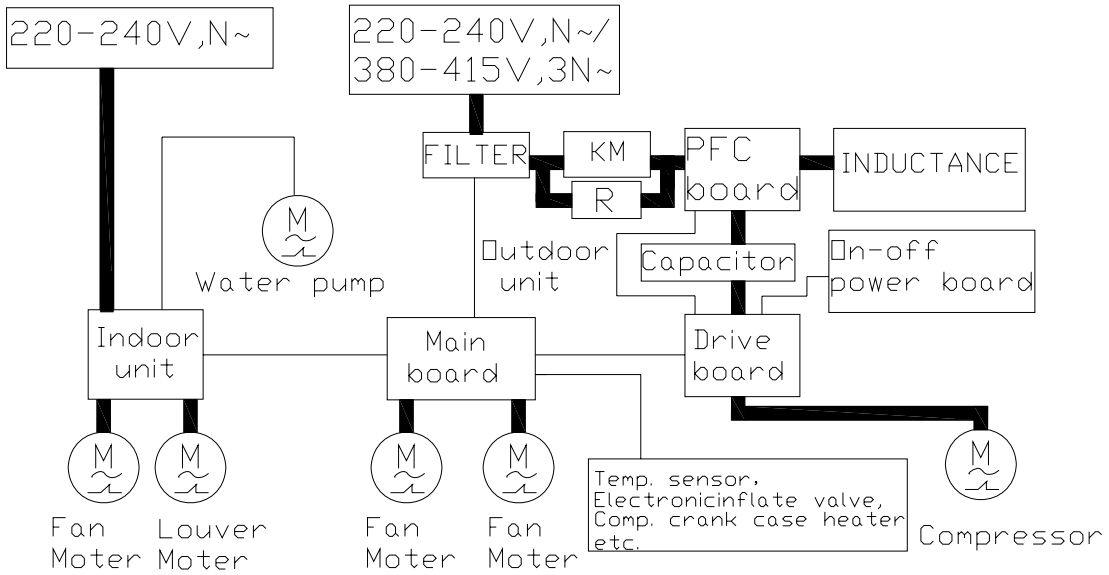
Ceiling-seated Indoor Unit:

ASF-18AI～ASF-42AI-3:



4 Power Distribution of Unit

Using the unit with the most complete function as the example, the power distribution is as follows:



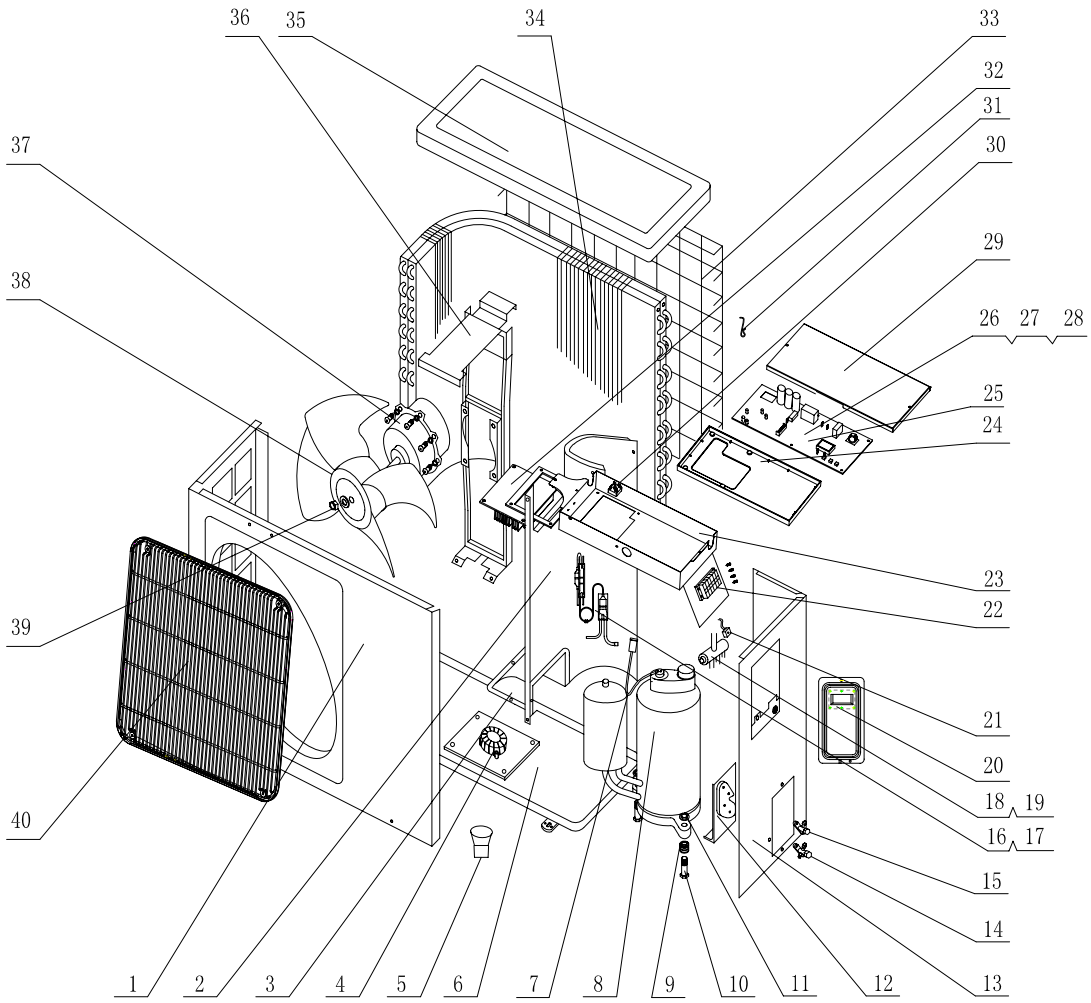
Note: The bold line indicates the main circuit and the fine line indicates the control circuit. The element on actual model shall be based on the actual circuit diagram.

4 Maintenance

Exploded View and Spare Parts List

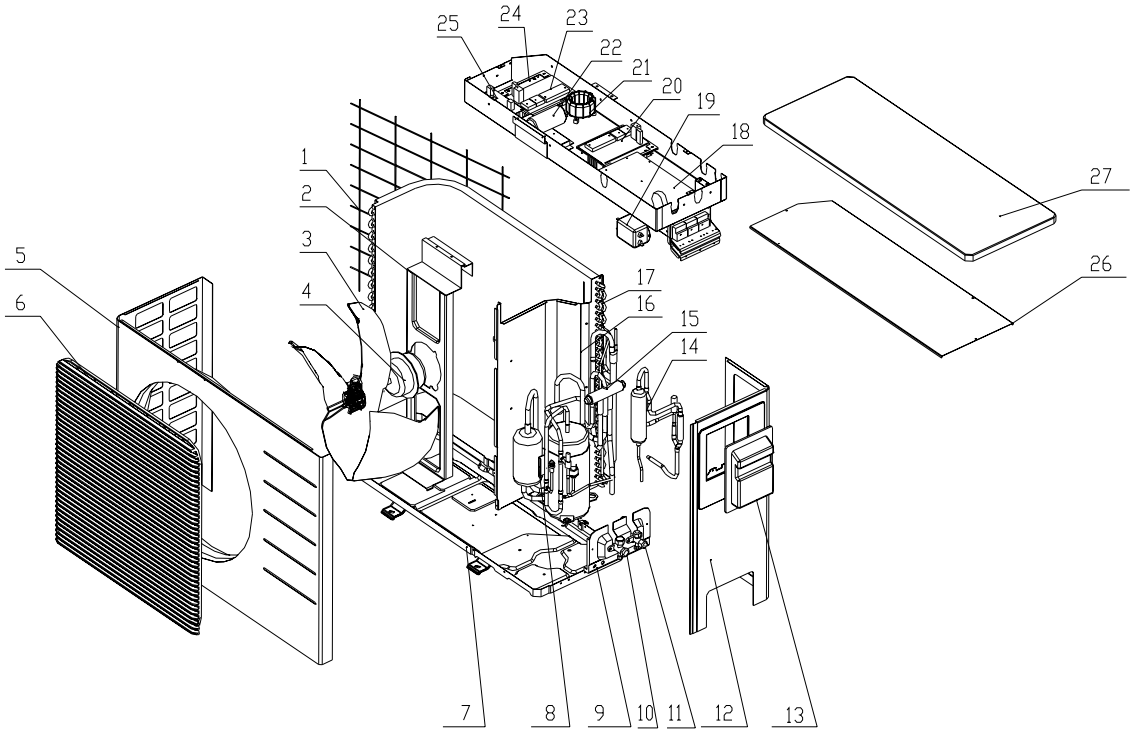
Outdoor Unit

ASGE-18AI



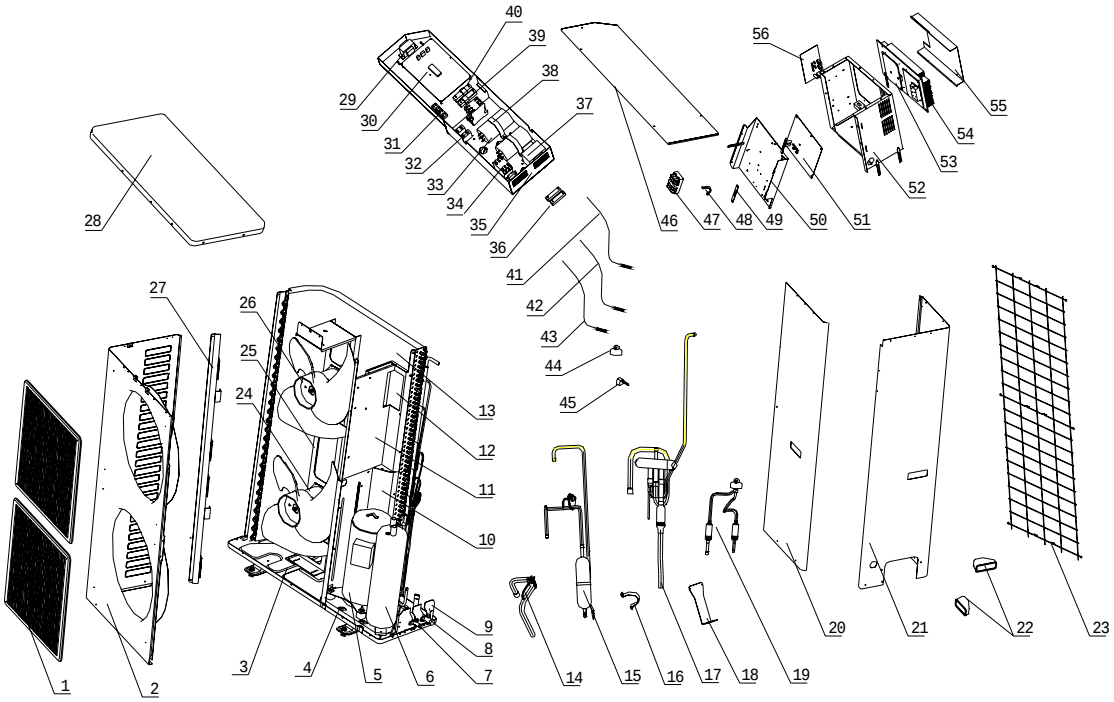
NO	**ASGE-18AI** (Spare Parts List)	QTY	code
1	Front Panel	1	01533007
2	Clap Board	1	01233012
3	Reactor Box C	1	01413504
4	PFC Inductance 315uH+315uH/15A	1	43120020
5	Drainage Connecter	1	06123401
6	Reactor Support Assy	1	01203102
7	Overload Protector	1	00183003
8	Compressor C-6RZ092H1AB	1	00102004
9	Compressor Gasket	3	76713006
10	Bolt	3	70210007
11	Nut	3	70310011
12	Valve Support	1	01713041
13	Right Side Plate Assy	1	01303071
14	Valve 1/2"	1	07100006
15	Valve 1/4"	1	07100003
16	Capillary Assy	1	03103301
17	One Way Valve	1	07130103
18	4-Way Valve	1	430004032
19	4-way Rever-sing Valve Component	1	03023670
20	Electric Cover Assy	1	01413086
21	4-way Valve Coil	1	430004002
22	Terminal Board A	1	42010255
23	Electric Box 2	1	01413025
24	Electric Box	1	20113001
25	PCB W9M32A	1	30039155
26	Temperature Sensor	1	3900012123
27	Sensor 20K	1	39000071
28	Exhaust Gas Temperature Sensor 50K	1	39000016
29	Electric Box Cover	1	01413048
30	Rectifier S25VB60	1	46010602
31	Sensor Insert	1	42020063
32	Radiator	1	49010213
33	Rear Grill	1	01473030
34	Condenser Assy	1	0110350713
35	Top Cover Assy	1	01253261
36	Motor Support Assy	1	017030521
37	Motor FW30K	1	15013067
38	Axial Flow Fan	1	10333414
39	Nut	1	70310131
40	Front Grill	1	22413011

ASGE-24AI



NO	**ASGE-24AI** (Spare Parts List)	QTY	code
1	Rear Grill	1	01473006
2	Motor Support	1	01805201
3	Axial Flow Fan	1	10335253
4	Motor FW68G	1	15013110
5	Front Side Plate Sub-Assy	1	01305017
6	Front Grill	1	22415001
7	Base Plate Assy	1	01195204P
8	Compressor And Fittings C-6RZ146H1A	1	00103501
9	Valve Support Assy	1	01715001
10	Cut-off valve1/2（R410A）	1	07103030
11	Cut-off valve3/8（R410A）	1	07130209
12	Right Side Plate Assy	1	01305029
13	Handle Sub-Assy	1	26235255
14	Electronic Expansile Valve Assy	1	07335203
15	4-way Valve Assy	1	04145205
16	Mid Clapboard	1	01245203
17	Condenser Assy	1	01125208
18	Main PCB1 WZ4D35	1	30224036
19	Filter FS23685-25-08	1	43130018
20	PFC Module1 Z81P	1	30111017
21	Inductance (PFC) 300uH+300uH/40A	1	43120011
22	Electrolytic Capacitor 1000uF/450V	2	33310111
23	Main PCB ZQ101	1	30221005
24	Radiator	1	49015201
	Radiator	1	49015202
25	Main PCB Z81P-1	1	30228104
26	Electric Box Cover	1	01424005
27	Top Cover Sub-Assy	1	01253452

ASGE-36AI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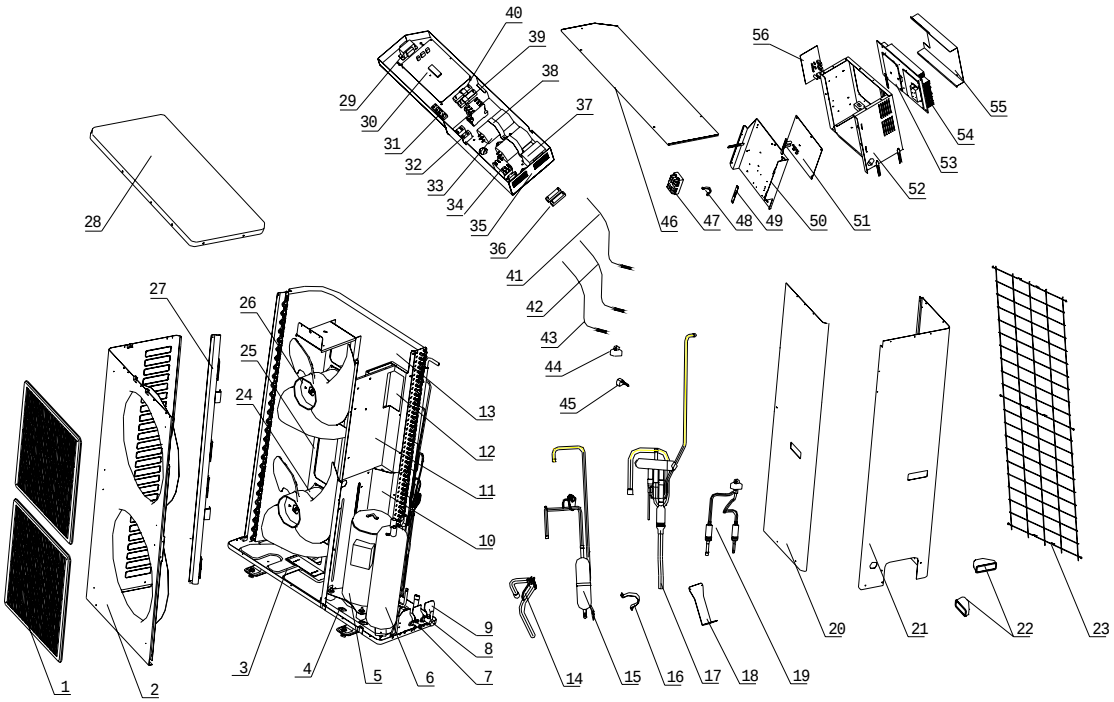
ASGE-36AI

NO	**ASGE-36AI** (Spare Parts List)	QTY	code
1	Front Grill	2	22414102
2	Front Plate	1	01435436
3	Metal Base	1	01195205P
4	Compressor Support Assay	1	01845203P
5	Compressor ANB42FBEMT	1	00205210
6	Liquid-gas Separator	1	07425200
7	Gas Valve	1	07130212
8	Liquid Valve	1	07130210
9	Valve Support Assy	1	01715001
10	Isolation Plate2	1	01245205
11	Isolation Plate1	1	01245204
12	Block Plate	1	01245206
13	Condenser Assy	1	01125210
14	Suction Assay	1	04675215
15	Clamp	1	0214000521
16	Discharge Assay	1	04635216
17	4-way Valve Assay	1	04145207
18	Fix Plate	1	01845209P
19	Electronic Expansile Valve Assy	1	07335204
20	Front Side Plate Assy	1	01305430
21	Back Side Plate	1	01305434
22	Handle	3	26235253
23	Protection Grill	1	01475432
24	Motor LW92C	2	150154511
25	Motor Support	1	01804113
26	Axial Flow Fan	2	10338731
27	Condenser Bracket	1	01895202
28	Top Cover	1	01255262
29	Transformer SC33A	1	43110177
30	Main PCB1 WZ4D35	1	30224036
31	Terminal Board	1	42011103
32	Capacitor CBB61 4uF/500V	2	33010013

33	Capacitor 4700uF/450V	1	33310524
34	AC Contactor	1	44010254
35	Electric Box Assay1	1	01395354
36	Cement Resistance 33KΩ/10W	0	
37	Inductance 275uH+275uH/40A	1	43120021
38	Cement Resistance 47Ω/40W	1	34050010
39	Clamp	1	02144701
40	Clamp	1	0214000512
41	Ambient Sensor(15K)	1	39000186
42	Temperature Sensor (20K)	1	390002004
43	Temperature Sensor (50K)	1	390002002
44	4-way Valve Coil	1	430004002
45	Electronic Expansile Valve Coil	1	43008765
46	Electric Box Cover2	1	01425212
47	Terminal Board	1	42011242
48	Wire Clamp	2	71010102
49	Isolation Washer D	1	70410525
50	Electric Box Assay2	1	01395355
51	Filter plate FS23588-40-24	1	43130019
52	Electric Box Cover Assay	1	01395356
53	Main PCB WZ863	1	30228604
54	Radiator	1	49018002
55	Guide Plate	1	01375207
56	Main PCB1 Z81P-1	1	30228104

ASGE-36AI-3, ASGE-42AI-3



NO	ASGE-36AI-3 (Spare Parts List)	QTY	CODE
1	Front Grill	2	22414102
2	Front Plate	1	01435436
3	Metal Base	1	01195205P
4	Compressor Support Assay	1	01845203P
5	Compressor ANB42FBEMT	1	00205210
6	Liquid-gas Separator	1	07425200
7	Gas Valve	1	07130212
8	Liquid Valve	1	07130210
9	Valve Support Assy	1	01715001
10	Isolation Plate2	1	01245205
11	Isolation Plate1	1	01245204
12	Block Plate	1	01245206
13	Condenser Assy	1	01125210
14	Suction Assay	1	04675215
15	Clamp	1	0214000521
16	Discharge Assay	1	04635216
17	4-way Valve Assay	1	04145207
18	Fix Plate	1	01845209P
19	Electronic Expansile Valve Assy	1	07335204
20	Front Side Plate Assy	1	01305430
21	Back Side Plate	1	01305434
22	Handle	3	26235253
23	Protection Grill	1	01475432
24	Motor LW92C	2	150154511
25	Motor Support	1	01804113
26	Axial Flow Fan	2	10338731
27	Condenser Bracket	1	01895202
28	Top Cover	1	01255262
29	Transformer 57X25D	1	43110240
30	Main PCB1 WZ4D35	1	30224036
31	Terminal Board	1	42011103
32	Capacitor CBB61 4uF/500V	2	33010013
33	Capacitor 4700uF/450V	2	33310524
34	AC Contactor	1	44010254

35	Electric Box Assay1	1	01395261
36	Cement Resistance 33KΩ/10W	2	34050009
37	Inductance L1.92mH	1	43130174
38	Cement Resistance 47Ω/40W	2	34050010
39	Clamp	2	02144701
40	Clamp	2	0214000512
41	Ambient Sensor(15K)	1	39000186
42	Temperature Sensor (20K)	1	390002004
43	Temperature Sensor (50K)	1	390002002
44	4-way Valve Coil	1	430004002
45	Electronic Expansile Valve Coil	1	43008765
46	Electric Box Cover2	1	01425212
47	Terminal Board T480C	1	42011043
48	Wire Clamp	2	71010102
49	Isolation Washer C	1	70410523
50	Electric Box Assay2	1	01395262
51	Filter plate WZ814A	1	30228111
52	Electric Box Cover Assay	1	01395255
53	Main PCB WZ863	1	30228604
54	Radiator	1	49015203
55	Guide Plate	1	01375207
56	Switch Power	1	30258110

NO	ASGE-42AI-3 (Spare Parts List)	QTY	CODE
1	Front Grill	2	22414102
2	Front Plate	1	01435436
3	Metal Base	1	01195205P
4	Compressor Support Assay	1	01845203P
5	Compressor ANB42FBEMT	1	00205210
6	Liquid-gas Separator	1	07425200
7	Gas Valve	1	07130212
8	Liquid Valve	1	07130210
9	Valve Support Assy	1	01715001
10	Isolation Plate2	1	01245205
11	Isolation Plate1	1	01245204
12	Block Plate	1	01245206
13	Condenser Assy	1	01125210
14	Suction Assay	1	04675215
15	Clamp	1	0214000521
16	Discharge Assay	1	04635216
17	4-way Valve Assay	1	04145207
18	Fix Plate	1	01845209P
19	Electronic Expansile Valve Assy	1	07335204
20	Front Side Plate Assy	1	01305430
21	Back Side Plate	1	01305434
22	Handle	3	26235253
23	Protection Grill	1	01475432
24	Motor LW92C	2	150154511
25	Motor Support	1	01804113
26	Axial Flow Fan	2	10338731
27	Condenser Bracket	1	01895202
28	Top Cover	1	01255262
29	Transformer 57X25D	1	43110240
30	Main PCB1 WZ4D35	1	30224036
31	Terminal Board	1	42011103
32	Capacitor CBB61 4uF/500V	2	33010013
33	Capacitor 4700uF/450V	2	33310524
34	AC Contactor	1	44010254

35	Electric Box Assay1	1	01395261
36	Cement Resistance 33KΩ/10W	2	34050009
37	Inductance L1.92mH	1	43130174
38	Cement Resistance 47Ω/40W	2	34050010
39	Clamp	2	02144701
40	Clamp	2	0214000512
41	Ambient Sensor(15K)	1	39000186
42	Temperature Sensor (20K)	1	390002004
43	Temperature Sensor (50K)	1	390002002
44	4-way Valve Coil	1	430004002
45	Electronic Expansile Valve Coil	1	43008765
46	Electric Box Cover2	1	01425212
47	Terminal Board T480C	1	42011043
48	Wire Clamp	2	71010102
49	Isolation Washer C	1	70410523
50	Electric Box Assay2	1	01395262
51	Filter plate WZ814A	1	30228111
52	Electric Box Cover Assay	1	01395255
53	Main PCB WZ863	1	30228604
54	Radiator	1	49015203
55	Guide Plate	1	01375207
56	Switch Power	1	30258110

Indoor Unit
Duct Type

ASD-18AI Spare Parts List

NO	ASD-18AI	QTY	CODE
1	Top Cover	1	01259064
2	Evaporator Assy	1	01038623
3	Liquid Inlet Pipe	1	03648601
4	Collecting Gas Pipe	1	03638625
5	Left Side Plate	1	0130866801
6	Left Support of Evaporator	1	01078629
7	Seal of Connection Pipe	1	01498640
8	Seal of Connection Pipe	1	01498644
9	Electric Box	1	01425703
10	Room Temp Sensor	1	3900012123
11	Tube Temp Sensor	1	390001921
12	Main Z8235	1	30228204
13	Transformer 54X25C	1	43110239
14	Remote Controller ZY512A	1	305050031
15	Capacitor CBB611A 3.5uF/450V	1	33010010
16			
17	Terminal Board	1	42010194
18	Isolation Washer C	1	70410523
19	Wire Clamp	3	71010103
20	Terminal Board 2-8	2	42011103
21	Hook	4	02118504
22	Right Side Plate	1	01308670
23	Left Support of Evaporator	1	01078625
24	Hook	2	02112446
25	Water Tray	1	01278633
26	Fan Fixed Plate	1	01339095
27	Motor Support	2	01709056
28	Blower Assy	2	15002401
29	Motor FG20C	1	15018322
30	Blower Assy		
31	Bottom Cover	1	01258649
32	Bottom Cover Assy		
33	Cover of Air-in	1	01258650
34	Side Plate of Air intake	1	01499061
35	Display Board Z44351_M	1	30294213

ASD-24AI Spare Parts List

NO	ASD-24A	QTY	CODE
1	Air filter	2	11125303
2	Seal of Connection Pipe	1	01495302
3	Left Side Plate	1	01315302
4	Top Cover	1	01265301
5	temp.sensor (15K)	1	3900012123
6	temp.sensor (20K)	1	3900012121
7	Electric Box	1	01395301
8	Main PCB2 Z8235	1	30228204
9	Transformer 54X25C	1	43110239
10	Capacitor CBB6 8uF/450V	1	33010014
11	Capacitor CBB61 5μF/450V	0	
12	Terminal Board 2-8	2	42011103
13	Terminal Board (5)	1	42010194
14	Isolation Washer C	1	70410523
15	Wire Clamp	2	71010102
16	Remote controller ZY512A	1	305050031
17	Display board Z4B351	1	30294213
18	water-level switch	1	450127011
19	pump	1	15405302
20	Water Tray	1	01285301
21	Bottom Cover	1	01265304
22	Fan (right) SYP-160/200J	1	15012458
23	Motor FG500A	1	15705301
24	Fan (left) SYP-160/200J	1	15012454
25	Fan Fixed Plate	1	01325301
26	Right Side Plate	1	01315304
27	Evaporator Assy	1	01025301
28	Hook	4	02112446

ASD-36AI , ASD-36AI-3 Spare Parts List

NO	ASD-36AI	QTY	CODE
1	Air filter	2	111253031
2	Seal of Connection Pipe	1	01495306
3	Left Side Plate	1	01315306
4	Top Cover	1	01265306
5	temp.sensor (15K)	1	3900012123
6	temp.sensor (20K)	1	3900012121
7	Electric Box	1	01399152

8	Main PCB2 Z8235	1	30228204
9	Transformer 54X25C	1	43110239
10	Capacitor CBB611A 12uF/450V	1	33010734
11	Capacitor CBB61 5μF/450V	0	
12	Terminal Board 2-8	2	42011103
13	Terminal Board (5 位)	1	42010194
14	Isolation Washer C	1	70410523
15	Wire Clamp	2	71010102
16	Remote controller ZY512A	1	305050031
17	Display board Z4B351	1	30294213
18	water-level switch	1	450127011
19	pump	1	15405302
20	Water Tray	1	01285323
21	Bottom Cover	1	15265301
22	Fan (right) SYP-200/190J-1	1	15018604
23	Motor FG500A	1	15019063
24	Fan (left) SYP-200/190J-1	1	15018603
25	Fan Fixed Plate	1	01325220
26	Right Side Plate	1	01315309
27	Evaporator Assy	1	01025302
28	Hook	4	02112466

ASD-42AI-3 Spare Parts List

NO	**ASD-42AI** Spare Parts List	QTY	CODE
1	Air filter	2	111253031
2	Seal of Connection Pipe	1	01495306
3	Left Side Plate	1	01315306
4	Top Cover	1	01265306
5	temp.sensor (15K)	1	3900012123
6	temp.sensor (20K)	1	3900012121
7	Electric Box	1	01399152
8	Main PCB2 Z8235	1	30228204
9	Transformer 54X25C	1	43110239
10	Capacitor CBB611A 12uF/450V	1	33010734
11	Capacitor CBB61 5μF/450V	0	
12	Terminal Board 2-8	2	42011103
13	Terminal Board (5)	1	42010194

14	Isolation Washer C	1	70410523
15	Wire Clamp	2	71010102
16	Remote controller ZY512A	1	305050031
17	Display board Z4B351	1	30294213
18	water-level switch	1	450127011
19	pump	1	15405302
20	Water Tray	1	01285323
21	Bottom Cover	1	15265301
22	Fan (right) SYP-200/190J-1	1	15018604
23	Motor FG500A	1	15019063
24	Fan (left) SYP-200/190J-1	1	15018603
25	Fan Fixed Plate	1	01325220
26	Right Side Plate	1	01315309
27	Evaporator Assy	1	01025302
28	Hook	4	02112466

Fůppr Ceoůomg Type

ASF-18AI Spare Parts List

NO	ASF-18A	QTY	CODE
1	Rear Side Plate	1	01302013
2	Handle	4	26232001
3	Left Decoration Plate	1	261124151
4	Rear Side Plate of Air Outlet	1	01302015
5	Louver	1	1051953201
6	Right Decoration Plate	1	261124161
7	Shaft of Louver II	2	10512026
8	Louver Support	2	24212019
9	Shaft of Louver I	1	10512025
10	Louver Fixer	1	24212018
11	Swing Louver	12	10512027
12	Connecting Lever	2	10582009
13	Connecting Lever	1	10582008
14	Right Swing Motor Fixer	1	26152006
15	Right Fixing Plate of Evaporator	1	01072411

16	Foam of Right Side Plate	1	12312404
17	Right Fixing Plate	1	01332404
18	Right Decoration Panel	1	26112027
19	Pipe Clamp Plate	1	0107243701
20	Capacitor CBB611A 3uF/450	1	33010027
21	Transformer 57X25C	1	43110237
22	Electric Box	1	01402407
23	Main PCB Z7A251B	1	30227021
24	Terminal Board RS9413G	1	42011159
25	Wire Base	1	24253001
	Wire Clamp	1	24253002
26	Fuse 5A 250VAC	1	46010013
27	Cover of Electric Box	1	01412408
28	Pipe Clip	1	70812001
29	Drainage Pipe	1	05235433
30	Display Board 5T52	1	30545654
31	Electric Box	1	20102138
32	Front Grill Clip 1	4	26252002
33	Filter	2	11122013
34	Front Grill	2	22412010
35	Front Grill Clip 2	4	26252003
36	Buttons Panel	1	201620041
37	Front Panel	1	01413008
38	Water Tray Panel	1	01272205P
39	Motor Support	1	01709532
40	Left Decoration Panel	1	26112028
41	Left Fixing Plate	1	01332405
42	Left Side Foam	1	12312403
43	Left Fixing Plate of Evaporator	1	01072410
44	Motor Clamp	2	26112026
45	Step Motor MP35CA	2	15212402
46	Left Swing Motor Fixer	1	26152005
47	Evaporator Assy	1	01032468

48	Liquid-intake Pipe Components	1	03222520
	Air Collecting Pipe Components	1	03533428
49	Temp Sensor （20K）	1	39000194
50	Temp Sensor Insert	1	42020063
51	Water Lead Panel	1	01362001
52	Cover of Evaporator	1	01072409
53	Fixed Mount	1	01708763
54	Centrifugal Fan	2	10312401
55	Rear Snail Shell	2	22202032
56	Front Snail Shell	2	22202031
57	Axes Connector	1	390001215
58	Bar Clasp	4	70819522
59	Hoop	1	70819521
60	Motor PG40F	1	15707302
61	Remote Controller	1	26112028
62	Connecting Cable	0	
63	Connecting Cable	0	
64	Signal Cable	1	4001023214

ASF-24AI Spare Parts List

NO	**ASC-24AI**	QTY	CODE
1	Left Decoration Plate	1	26112417
2	Shaft of Louver I	2	10512025
3	Swing Louver Fixer	1	01332410
4	Louver Support	3	24212020
5	Louver Fixer	2	24222016
6	Louver	1	10512404
7	Shaft of Louver II	2	10512026
8	Right Decoration Plate	1	26112421
9	Left Swing Motor Fixer	1	26152007
10	Front Panel	1	01532414
11	Electric Box	1	20102138
12	Display Board	1	30545654

13	Buttons Panel	1	20162004
14	Right Swing Motor Fixer	1	26152008
15	Step Motor MP35CA	2	15212402
16	Motor Clamp	4	26112026
17	Water Tray	1	01272411
18	Auxiliary Water Tray	1	01272413
19	Pipe Clip	1	70812001
20	Drainage Pipe	1	05235433
21	Handle	4	26232001
22	Foam of Right Side Plate	1	12312408
23	Right Fixing Palte	1	01332404
24	Support of Motor Bearing	2	01792408
25	Fixer of Motor Support	1	01792409
26	Right Decoration Panel	1	26112033
27	Pipe Clamp	1	01072424
28	Electric Box	1	01402407
29	Wire Base	1	24253001
30	Wire Clamp	1	24253002
31	Terminal Board RS9413G	1	42011159
32	Fuse 5A 250VAC	1	46010013
33	Main PCB Z7A251B	1	`30227021
34	Ring of Bearing	2	76512404
35	Fan Bearing	2	76512210
36	Transformer 57X25C	1	43110237
37	Cover of Electric Box	1	01412408
38	Centrifugal Fan	4	10312401
39	Rotary Axis	2	73012401
40	Capacitor CBB61 3uF/450V	1	33010027
41	Capacitor Fixer	0	
42	Motor FN100B	1	`15012406
43	Motor Fixer	1	01722409
44	Motor Clamp	4	01702405
45	Axes Connector	2	73012403

46	Motor Fixing Plate	1	01332426
47	Front Snail Shell	4	22202031
48	Rear Snail Shell	4	22202032
49	Rear Side Plate	1	01302419
50	Motor Support	1	01702410
51	Filter	2	11122012
52	Water Lead Plate	1	01362401
53	Front Grill	2	22412011
54	Front Grill Clip 2	4	26252003
55	Remote Controller Y512	1	305125063
56	Evaporator Assy	1	010024052
57	Front Grill Clip 1	4	26252002
58	Temp Sensor	1	390001215
59	Temp Sensor Insert	1	42020063
60	Cover of Evaporator	1	01072417
61	Left Decoration Panel	1	26112032
62	Left Fixing Plate	1	01332405
63	Left Side Foam	1	12312405
64	Bearing Fixing Plate	1	01332407
65	Rear Side Plate of Air Outlet	1	01302405
66	Connecting Lever	3	10582008
67	Connecting Lever	2	10582009
68	Swing Louver	22	10512028

ASF-36AI, ASF-36AI-3 Spare Parts List

NO		QTY	CODE
1	Left Decoration Plate	1	261124151
2	Shaft of Louver I	2	10512025
3	Swing Louver Fixer	1	0133241801
4	Louver Support	4	24212019
5	Louver Fixer	3	24212018
6	Shaft of Louver II	3	10512026

7	Louver	1	105124081
8	Right Decoration Plate	1	261124161
9	Left Swing Motor Fixer	1	26152005
10	Front Panel	1	015324091
11	Display Box	1	20102138
12	Display Board 5T52	1	30545654
13	Buttons Panel	1	01544106
14	Right Swing Motor Fixer	1	26152006
15	Step Motor MP35CA	1	15212402
16	Motor Clamp	2	26112026
17	Water Tray	1	01272410
18	Auxiliary Water Tray	1	01272409
19	Pipe Clip	1	70812001
20	Drainage Pipe	1	05235433
21	Handle	4	26232001
22	Foam of Right Side Plate	1	12312402
23	Right Fixing Palte	1	01332404
24	Support of Motor Bearing	2	01792408
25	Fixer of Motor Support	1	01792407
26	Right Decoration Panel	1	26112027
27	Pipe Clamp	1	01072425
28	Electric Box	1	01402407
29	Wire Base	1	24253001
30	Wire Clamp	1	24253002
31	Terminal Board	1	42011159
32	Fuse 5A 250VAC	0	
33	Main PCB Z7A251B	1	30227021
34	Ring of Bearing	2	76512404

35	Fan Bearing	2	76512210
36	Transformer 57×25C	1	43110237
37	Cover of Electric Box	1	01412408
38	Centrifugal Fan	4	10319051
39	Rotary Axis	2	73012402
40	Capacitor CBB61A 6uF/500V	1	33010037
41	Capacitor Fixer	0	
42	Motor FN180A	1	15012405
43	Motor Fixer	1	01722410
44	Motor Clamp	2	01702409
45	Axes Connector	2	73012403
46	Motor Fixing Plate	1	01332425
47	Front Snail Shell	4	22202030
48	Rear Snail Shell	4	22202029
49	Rear Side Plate	1	01302431
50	Motor Support	1	01702411
51	Filter	4	11122013
52	Water Lead Plate	1	01362407
53	Front Grill	4	22412010
54	Front Grill Clip 2	8	26252003
55	Remote Controller Y512A	1	305050031
56	Evaporator Assy	1	01029609
57	Front Grill Clip 1	8	26252002
58	Temp Sensor	1	39000198
	Temp Sensor	1	390001981
	Temp Sensor	1	390001982
	Temp Sensor	1	390001983
59	Temp Sensor Insert	3	42020063

60	Cover of Evaporator	1	01072409
61	Left Decoration Panel	1	26112028
62	Left Fixing Plate	1	01332405
63	Left Side Foam	1	12312401
64	Bearing Fixing Plate	1	01332406
65	Rear Side Plate of Air Outlet	1	01302416
66	Connecting Lever	2	10582008
67	Connecting Lever	4	10582009
68	Swing Louver	26	10512027

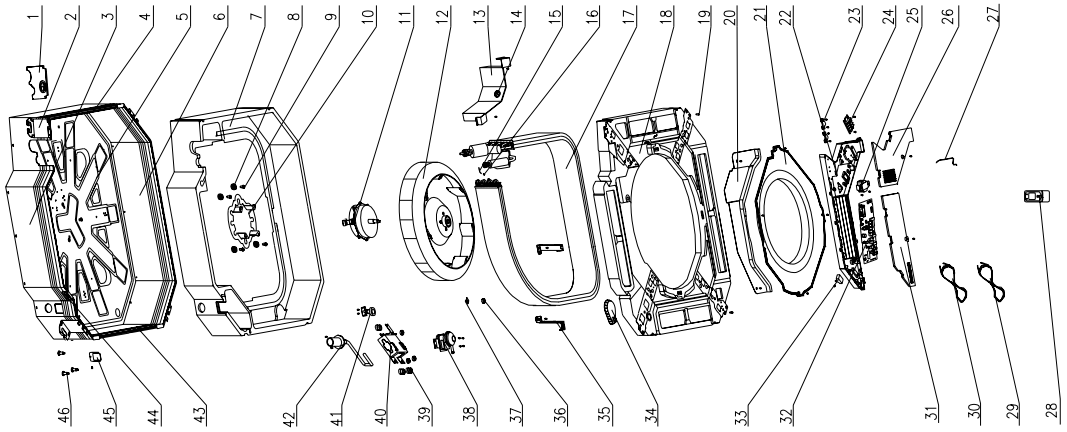
ASF-42AI-3 Spare Parts List

NO	**ASC-42AI-3**	QTY	CODE
1	Left Decoration Plate	1	261124151
2	Shaft of Louver I	2	10512025
3	Swing Louver Fixer	1	0133241801
4	Louver Support	4	24212019
5	Louver Fixer	3	24212018
6	Shaft of Louver II	3	10512026
7	Louver	1	105124081
8	Right Decoration Plate	1	261124161
9	Left Swing Motor Fixer	1	26152005
10	Front Panel	1	015324091
11	Display Box	1	20102138
12	Display Board 5T52	1	30545654
13	Buttons Panel	1	01544106
14	Right Swing Motor Fixer	1	26152006
15	Step Motor MP35CA	1	15212402
16	Motor Clamp	2	26112026
17	Water Tray	1	01272410

18	Auxiliary Water Tray	1	01272409
19	Pipe Clip	1	70812001
20	Drainage Pipe	1	05235433
21	Handle	4	26232001
22	Foam of Right Side Plate	1	12312402
23	Right Fixing Palte	1	01332404
24	Support of Motor Bearing	2	01792408
25	Fixer of Motor Support	1	01792407
26	Right Decoration Panel	1	26112027
27	Pipe Clamp	1	01072425
28	Electric Box	1	01402407
29	Wire Base	1	24253001
30	Wire Clamp	1	24253002
31	Terminal Board	1	42011159
32	Fuse 5A 250VAC	0	
33	Main PCB Z7A251B	1	30227021
34	Ring of Bearing	2	76512404
35	Fan Bearing	2	76512210
36	Transformer 57×25C	1	43110237
37	Cover of Electric Box	1	01412408
38	Centrifugal Fan	4	10319051
39	Rotary Axis	2	73012402
40	Capacitor CBB61A 6uF/500V	1	33010037
41	Capacitor Fixer	0	
42	Motor FN180A	1	15012405
43	Motor Fixer	1	01722410
44	Motor Clamp	2	01702409
45	Axes Connector	2	73012403

46	Motor Fixing Plate	1	01332425
47	Front Snail Shell	4	22202030
48	Rear Snail Shell	4	22202029
49	Rear Side Plate	1	01302431
50	Motor Support	1	01702411
51	Filter	4	11122013
52	Water Lead Plate	1	01362407
53	Front Grill	4	22412010
54	Front Grill Clip 2	8	26252003
55	Remote Controller Y512A	1	305050031
56	Evaporator Assy	1	01029609
57	Front Grill Clip 1	8	26252002
58	Temp Sensor	1	39000198
	Temp Sensor	1	390001981
	Temp Sensor	1	390001982
	Temp Sensor	1	390001983
59	Temp Sensor Insert	3	42020063
60	Cover of Evaporator	1	01072409
61	Left Decoration Panel	1	26112028
62	Left Fixing Plate	1	01332405
63	Left Side Foam	1	12312401
64	Bearing Fixing Plate	1	01332406
65	Rear Side Plate of Air Outlet	1	01302416
66	Connecting Lever	2	10582008
67	Connecting Lever	4	10582009
68	Swing Louver	26	10512027

Cassette Type



ASC-36AI, ASC-36AI-3 Spare Parts List

NO	ASC-36AI	QTY	CODE
1	Tube Exit Plate	1	01382715
2	Body Fixed Plate	4	01332701
3	Front Side Plate	1	01302713
4	Left Side Plate	1	01302711
5	Base Plate	1	01222732
6	Rear Side Plate	1	01302709
7	Bottom Foam	1	52012721
8	Motor Gasket	4	76712711
9	Bolt	3	70212701
10	Motor Support	1	01702701
11	Motor FN60T	1	15012706
12	Centifugal Fan	1	10310101
13	Evaporator Linkage	1	01072730
14	Cable-cross Loop	1	76512702
15	Tube sensor	1	390001921

16	sensor insert B	1	42020063
17	Evaporator Assy	1	01029607
18	Water Tray Assy	1	20182701
19	Rubber Stem	1	76712701
20	Electric Base Plate	1	01412721
21	Flow-guide Loop	1	10372722
22	Electric Box	1	01399608
23	Wire Clamp	1	71010102
24	Terminal Board (5)	1	42010258
25	Transformer	1	43110233
26	Electric Box Cover I	1	20102702
27	Room Sensor	1	390001911
28	Remote Controller	1	305125063
29	Signal Cable	0	
30	Signal Cable	0	
31	Electric Box Cover II	1	20102703
32	Main PCB Z71351E	1	30227111
33	Capacitor CBB61 4.5uF/450V	1	33010012
34	Drainage Plastic	1	05230025
35	Evap Support	2	01072705
36	Nut with Washer M6	7	70310012
37	Fan Fixer	1	10312701
38	Water Pump	1	43130324
39	Pump Gasket	3	76712702
40	Pump Support	1	01332721
41	Water Level Switch	1	45010201
42	Pump Drainpipe	1	05230026
43	Right Side Plate	1	01302712

44	Cable-cross Block	0	
45	Pump Cover Plate	1	01252713
46	Bolt	0	

ASC-42AI-3 Spare Parts List

NO	ASC-42A	QTY	CODE
1	Tube Exit Plate	1	01382715
2	Body Fixed Plate	4	01332701
3	Front Side Plate	1	01302713
4	Left Side Plate	1	01302711
5	Base Plate	1	01222732
6	Rear Side Plate	1	01302709
7	Bottom Foam	1	52012721
8	Motor Gasket	4	76712711
9	Bolt	3	70212701
10	Motor Support	1	01702701
11	Motor FN60T	1	15012706
12	Centifugal Fan	1	10310101
13	Evaporator Linkage	1	01072730
14	Cable-cross Loop	1	76512702
15	Tube sensor	1	390001921
16	sensor insert B	1	42020063
17	Evaporator Assy	1	01029607
18	Water Tray Assy	1	20182701
19	Rubber Stem	1	76712701
20	Electric Base Plate	1	01412721
21	Flow-guide Loop	1	10372722
22	Electric Box	1	01399608
23	Wire Clamp	1	71010102

24	Terminal Board (5)	1	42010258
25	Transformer	1	43110233
26	Electric Box Cover I	1	20102702
27	Room Sensor	1	390001911
28	Remote Controller	1	305125063
29	Signal Cable	0	
30	Signal Cable	0	
31	Electric Box Cover II	1	20102703
32	Main PCB Z71351E	1	30227111
33	Capacitor CBB61 4.5uF/450V	1	33010012
34	Drainage Plastic	1	05230025
35	Evap Support	2	01072705
36	Nut with Washer M6	7	70310012
37	Fan Fixer	1	10312701
38	Water Pump	1	43130324
39	Pump Gasket	3	76712702
40	Pump Support	1	01332721
41	Water Level Switch	1	45010201
42	Pump Drainpipe	1	05230026
43	Right Side Plate	1	01302712
44	Cable-cross Block	0	
45	Pump Cover Plate	1	01252713
46	Bolt	0	